

FIG. 1

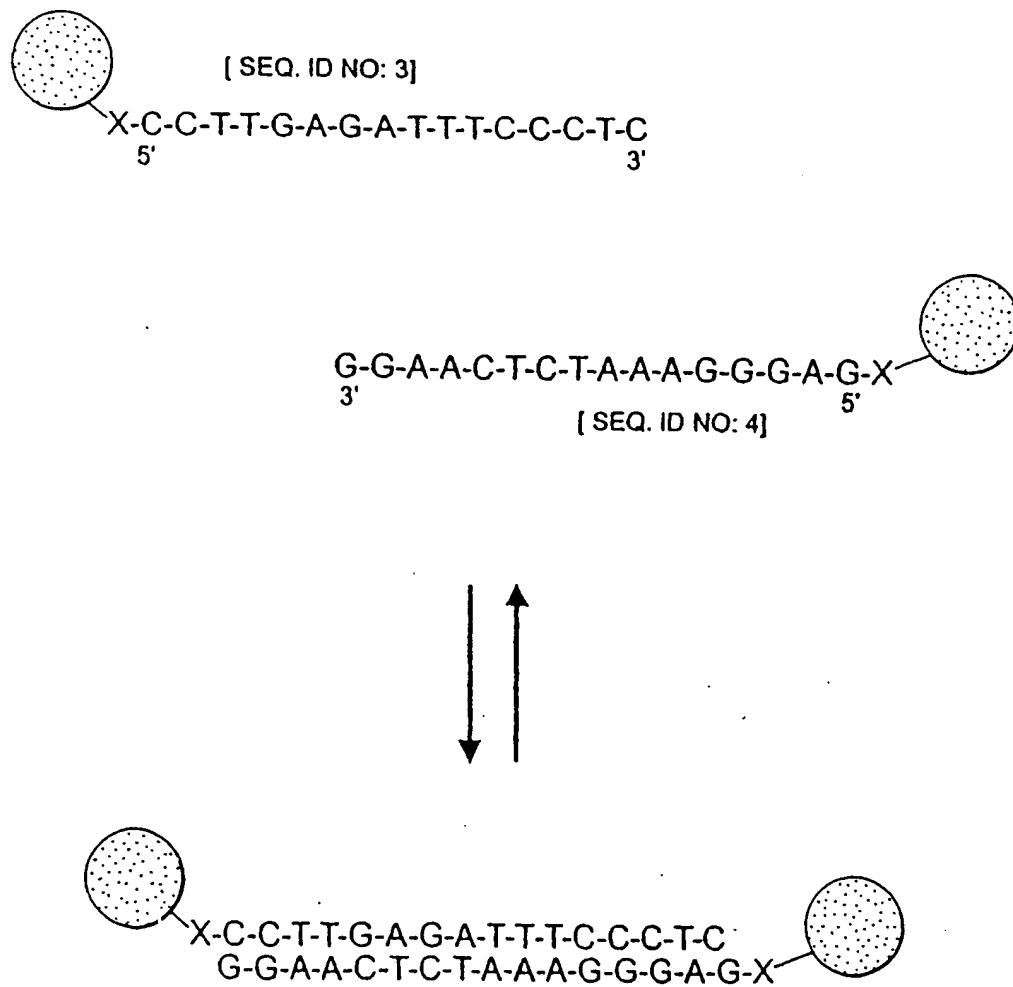


FIG. 2

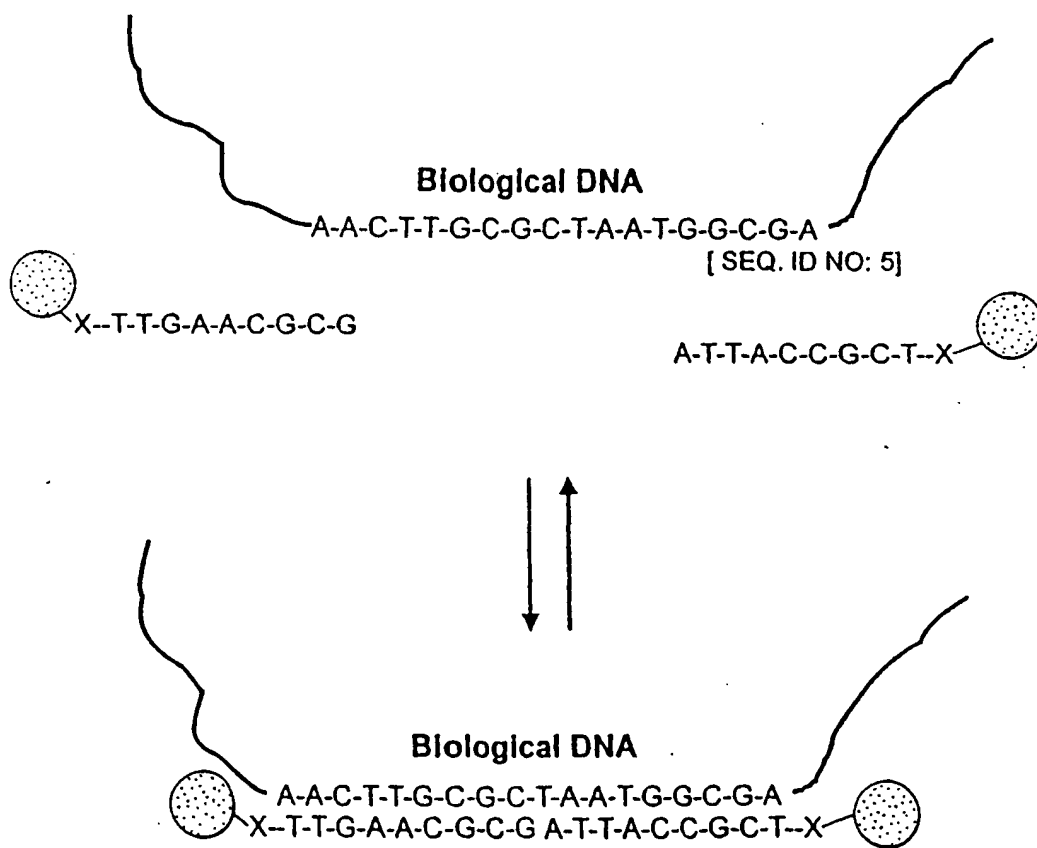
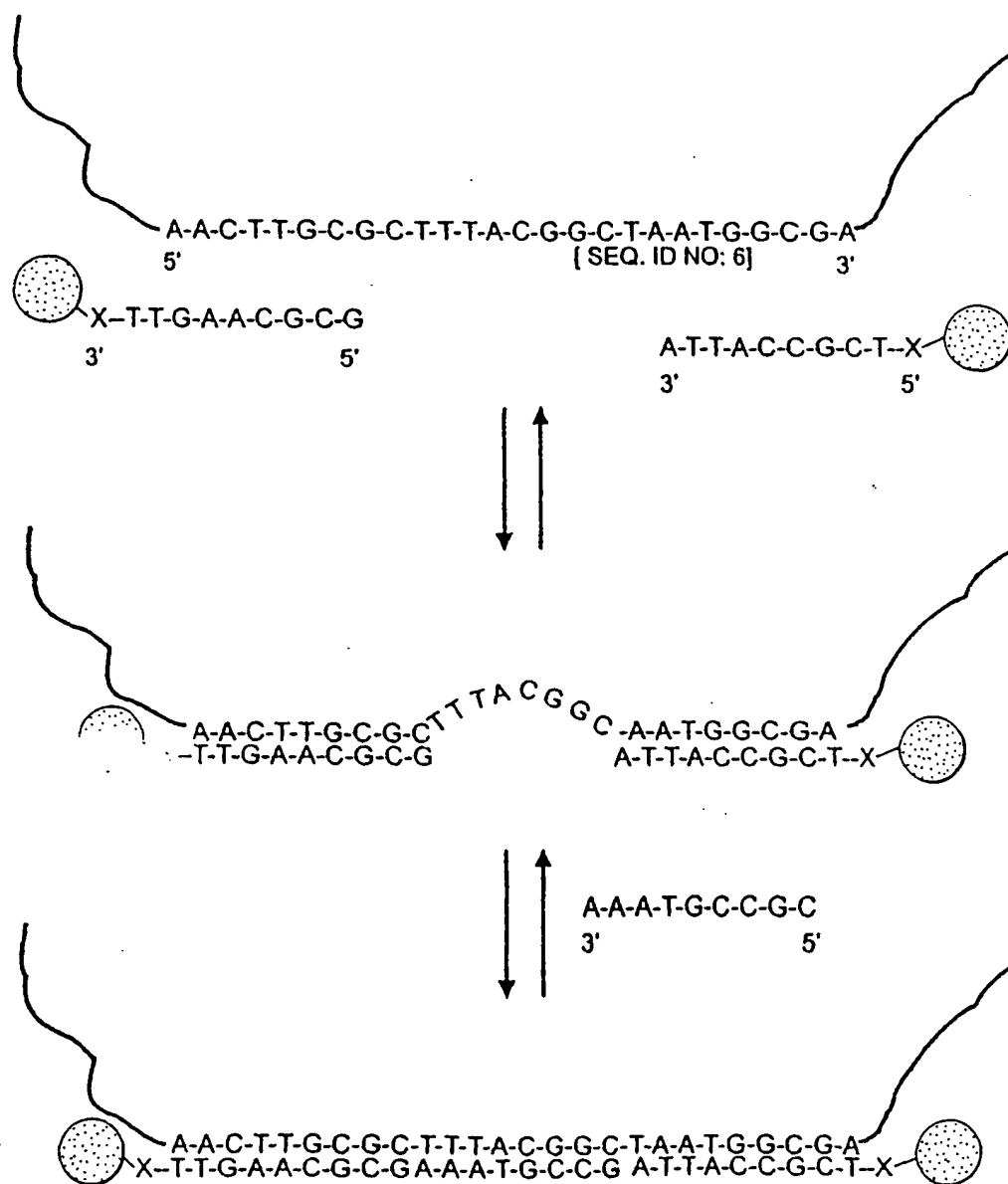


FIG. 3



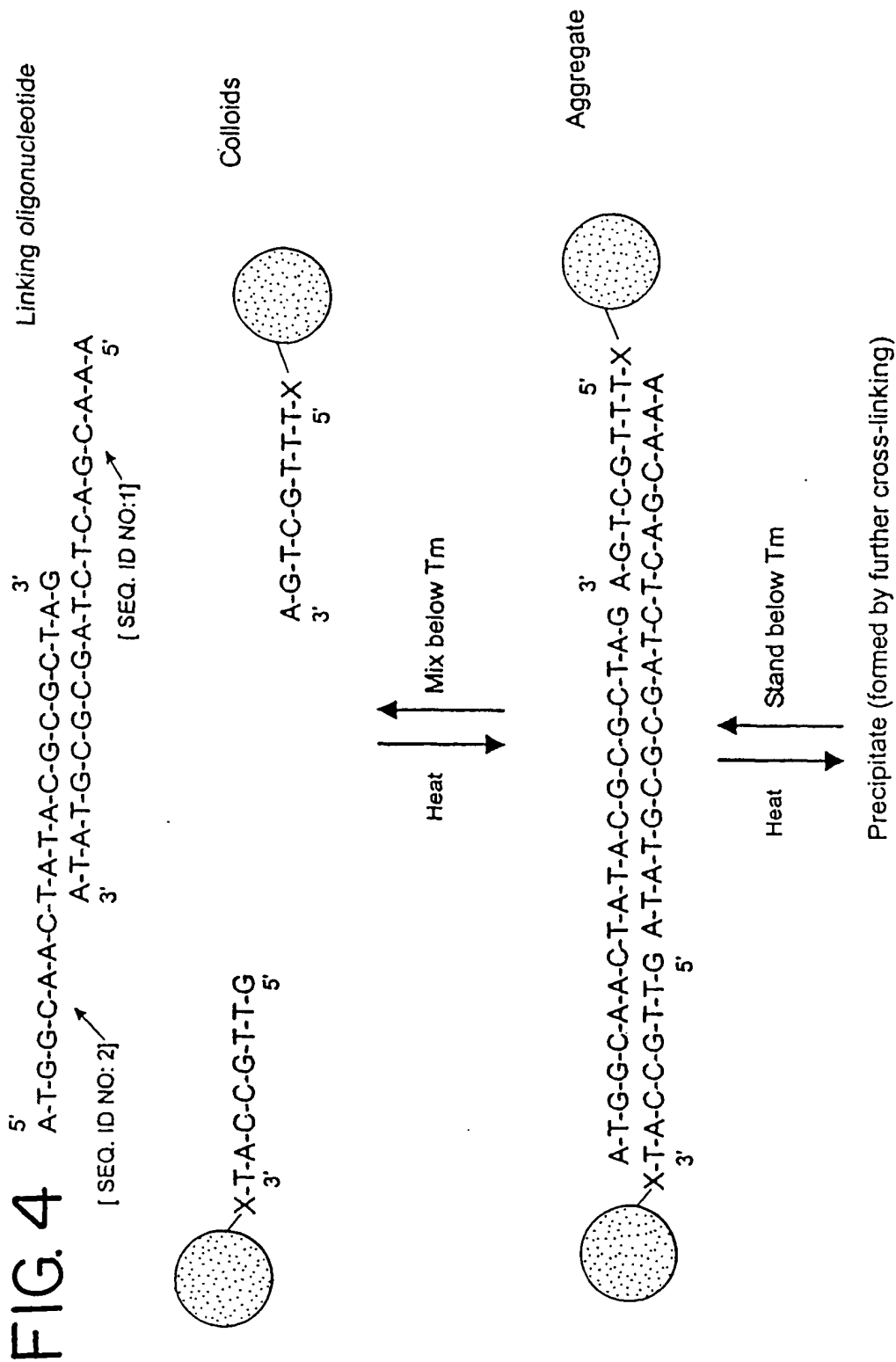


FIG. 5

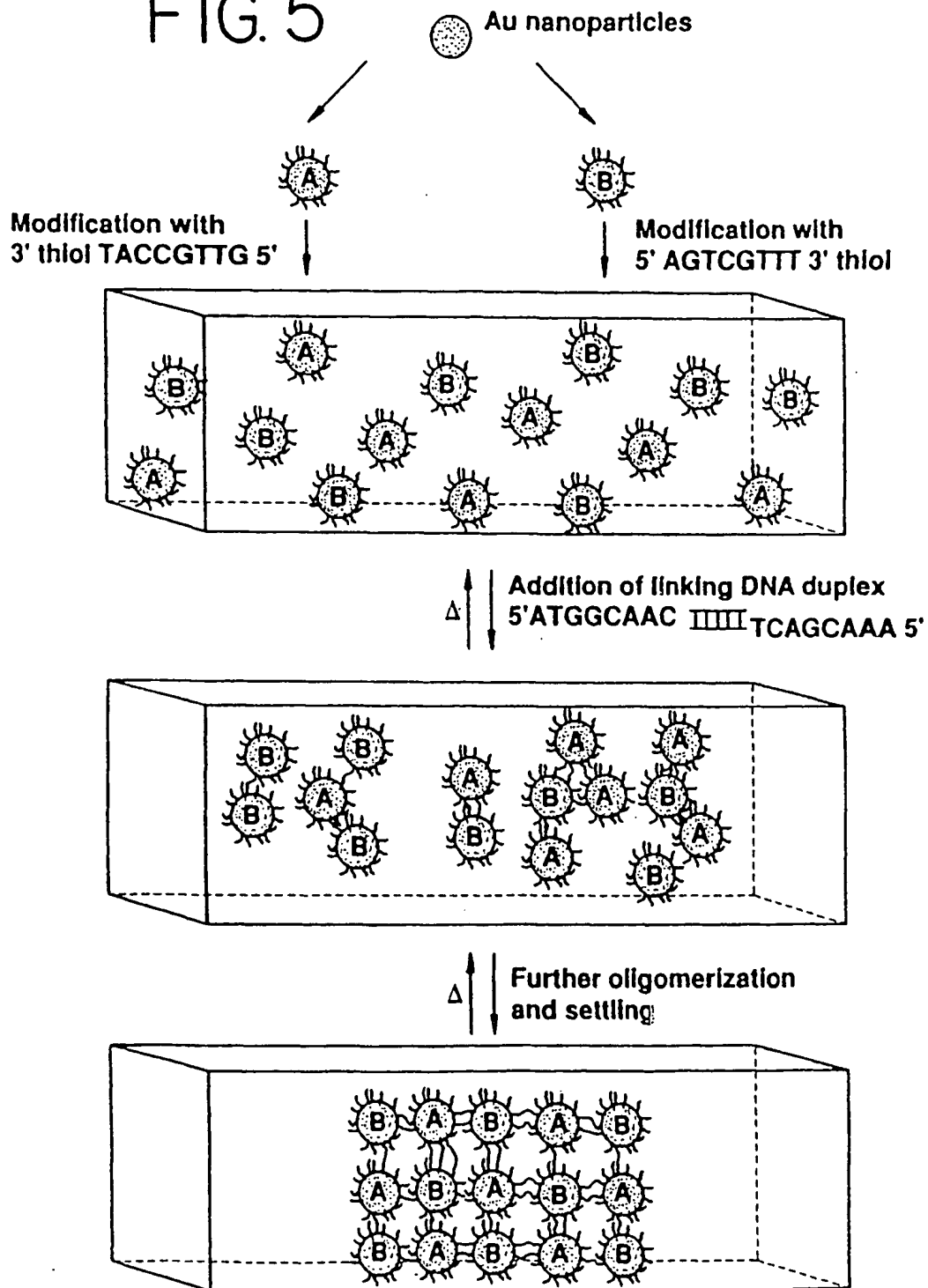


FIG. 6A FIG. 6B FIG. 6C



FIG. 7

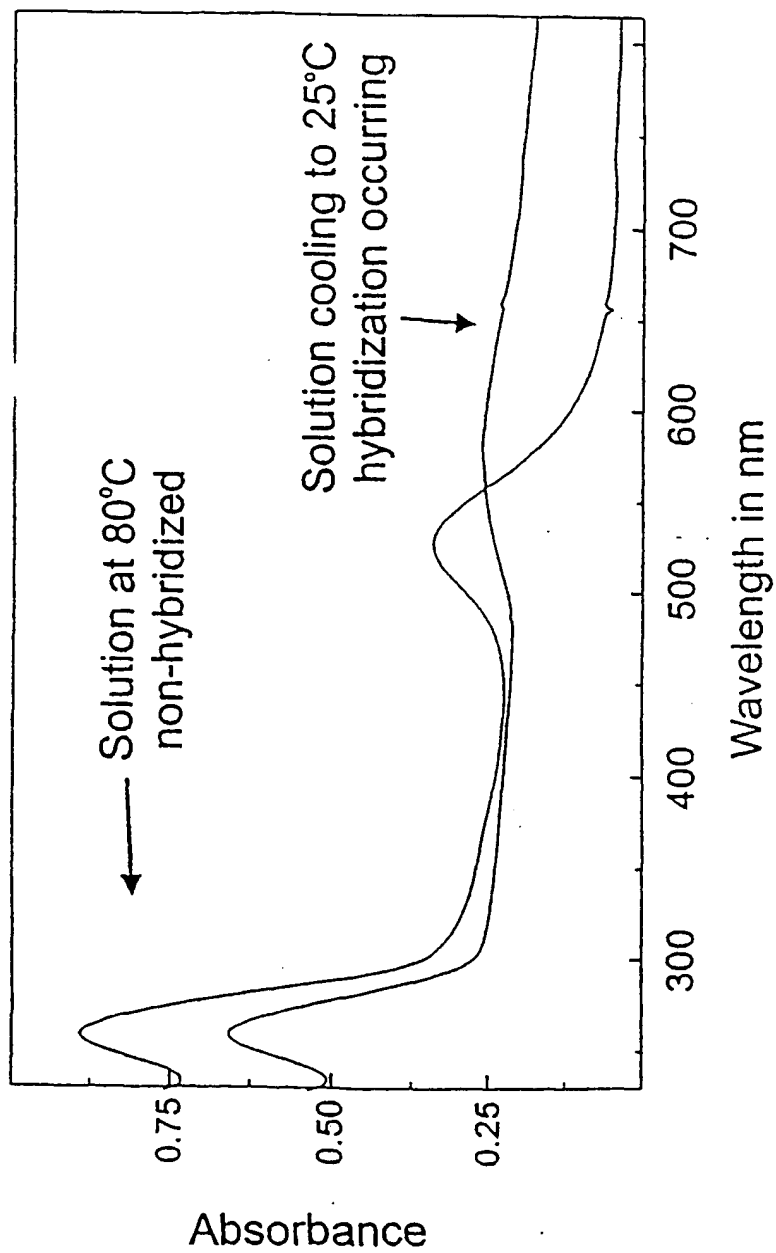


FIG. 8B

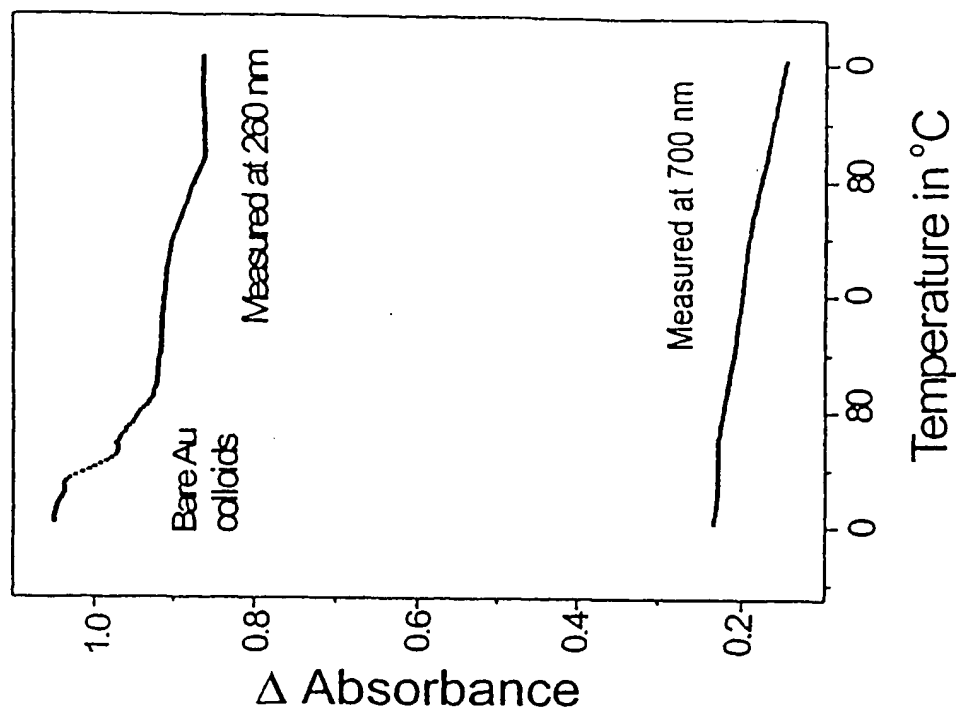


FIG. 8A

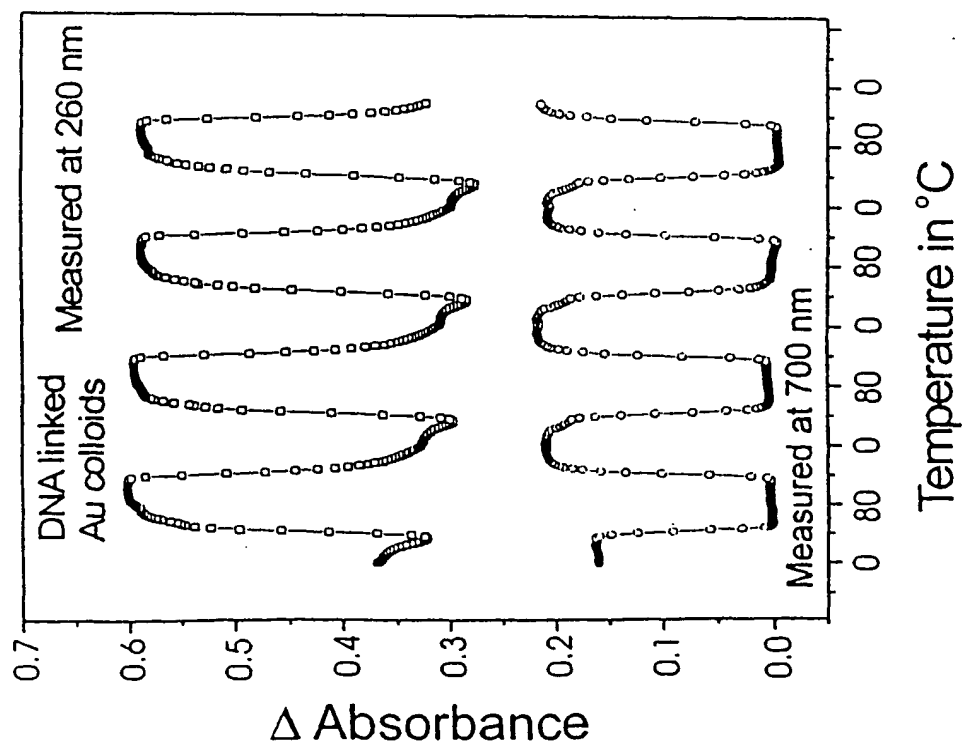


FIG. 9A

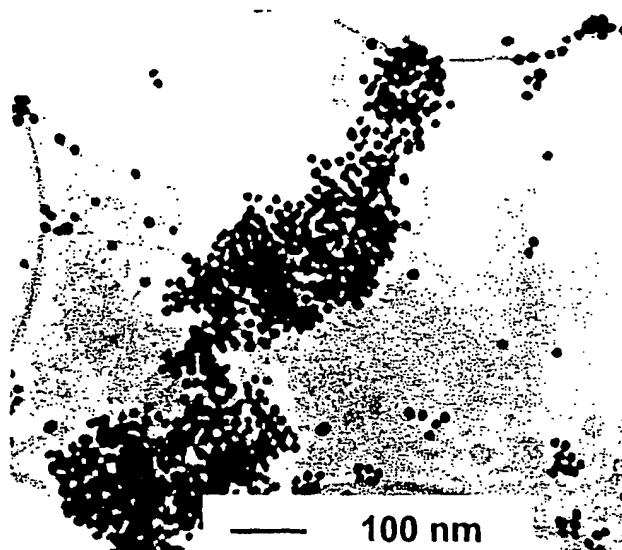


FIG. 9B

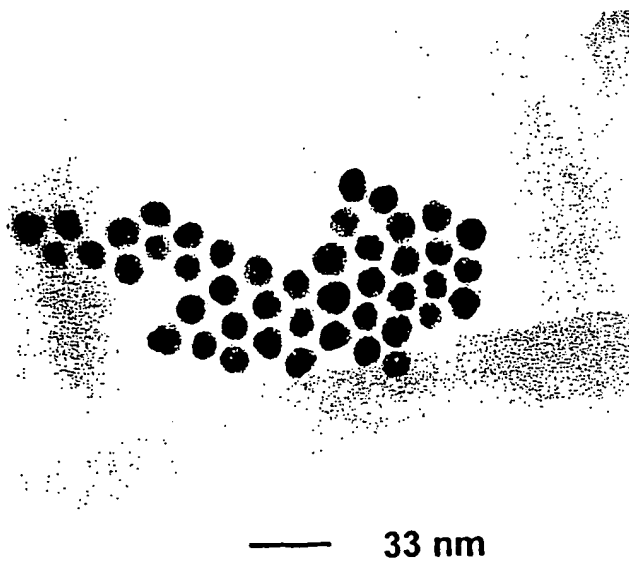


FIG. 10

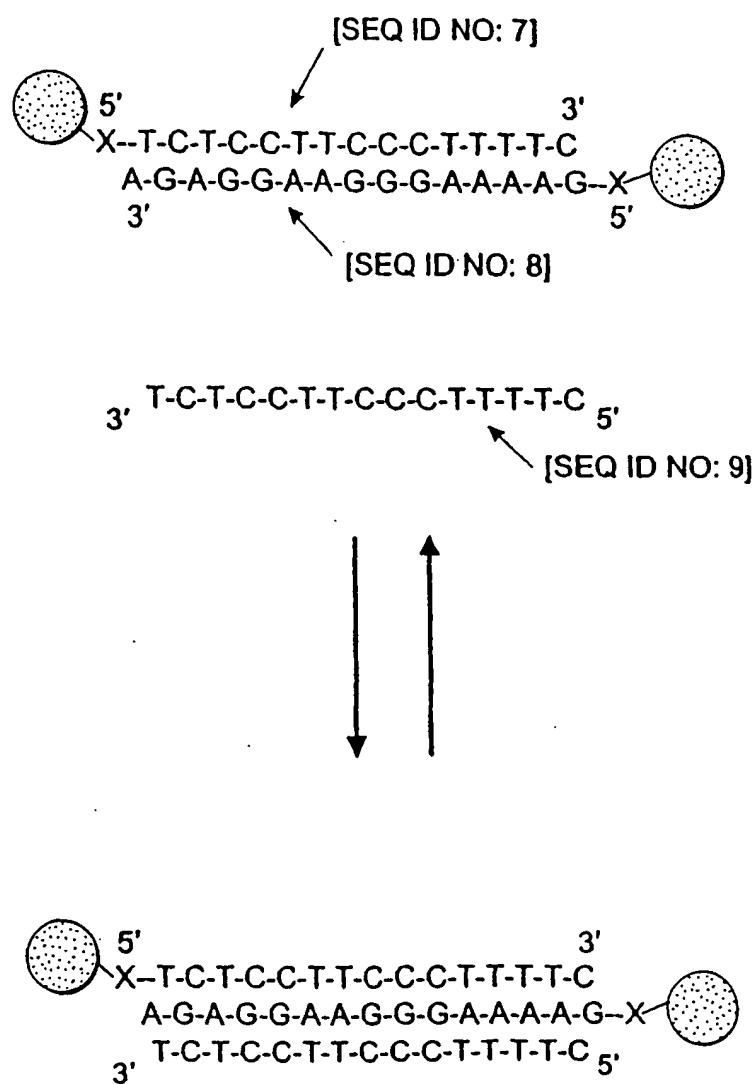


FIG. 11

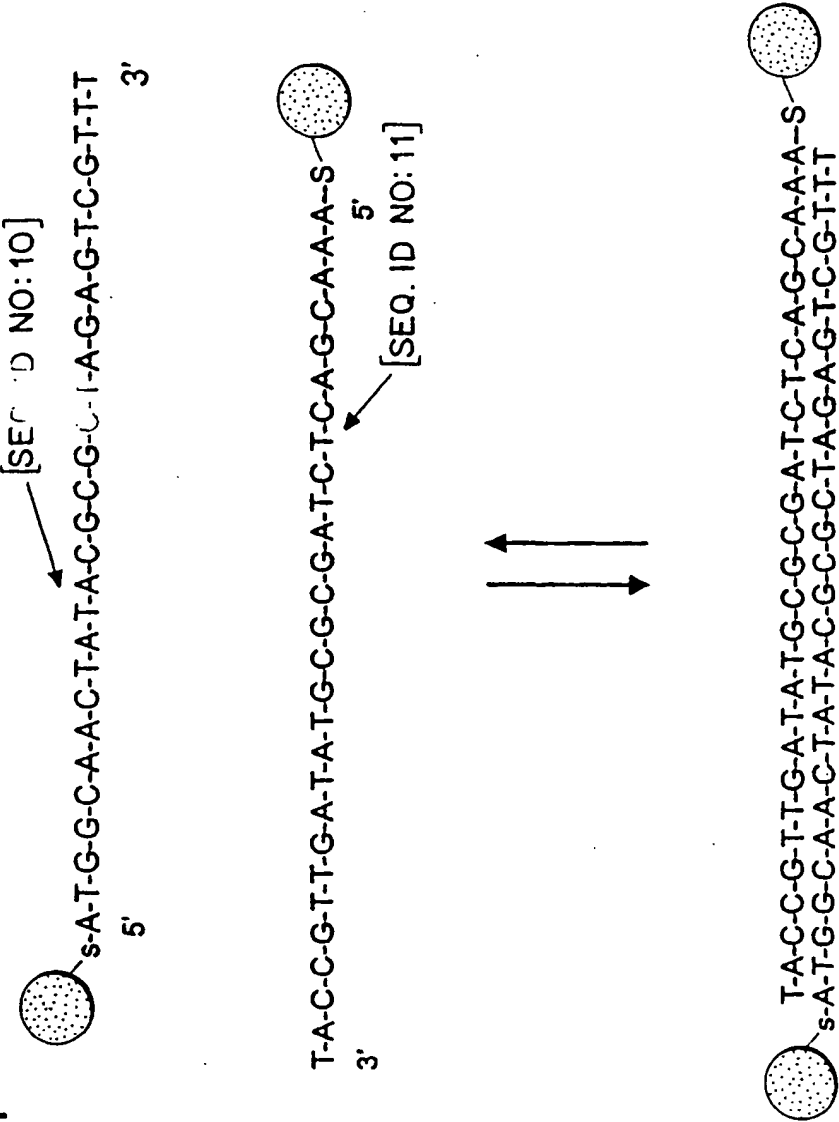


FIG. 12A

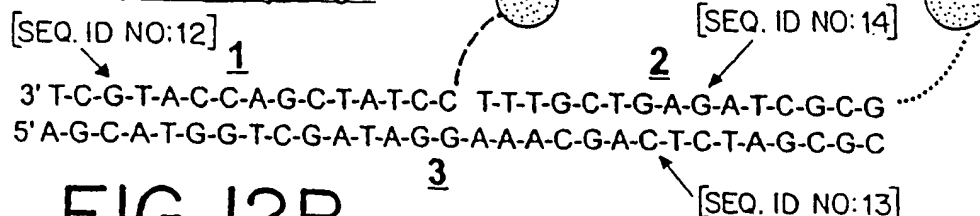
Complementary Target

FIG. 12B

Probes without Target

FIG. 12C

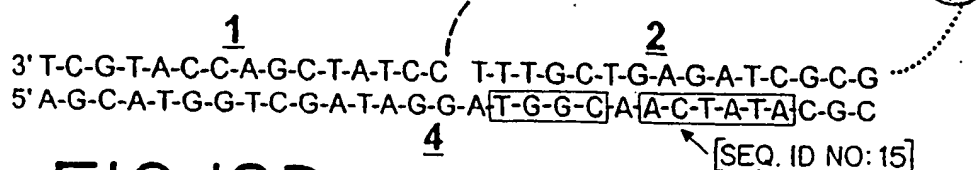
Half Complementary Target

FIG. 12D

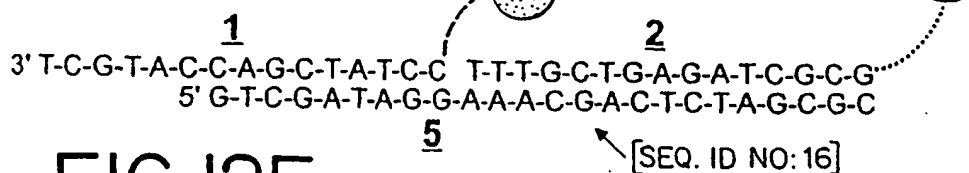
Target - 6 bp

FIG. 12E

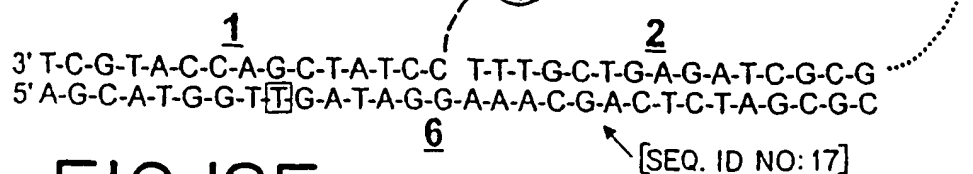
One bp Mismatch

FIG. 12F

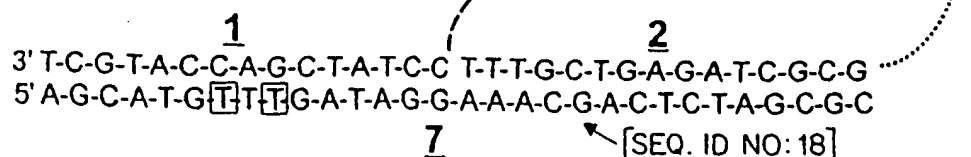
Two bp Mismatch

FIG. 13A

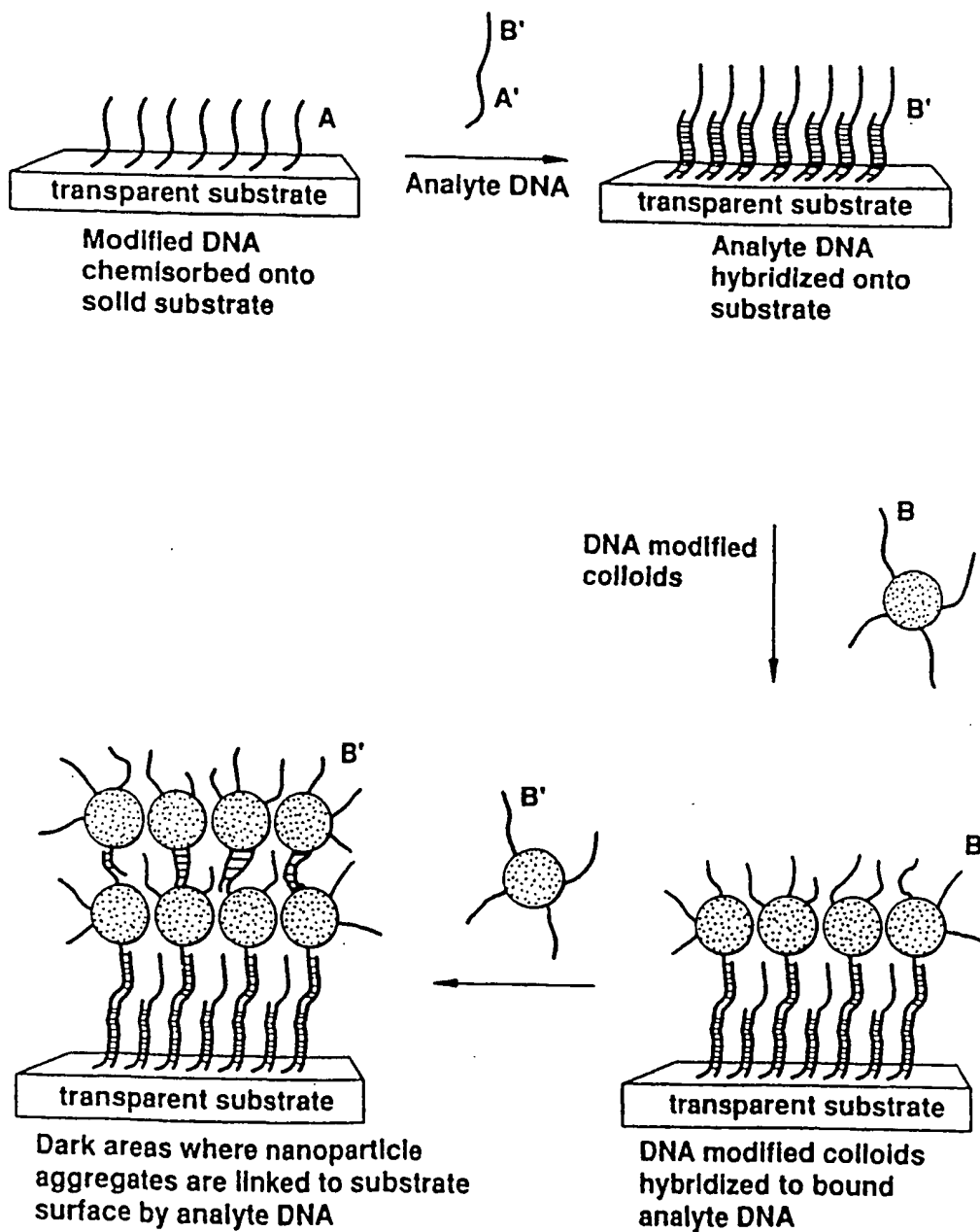


FIG. 13B

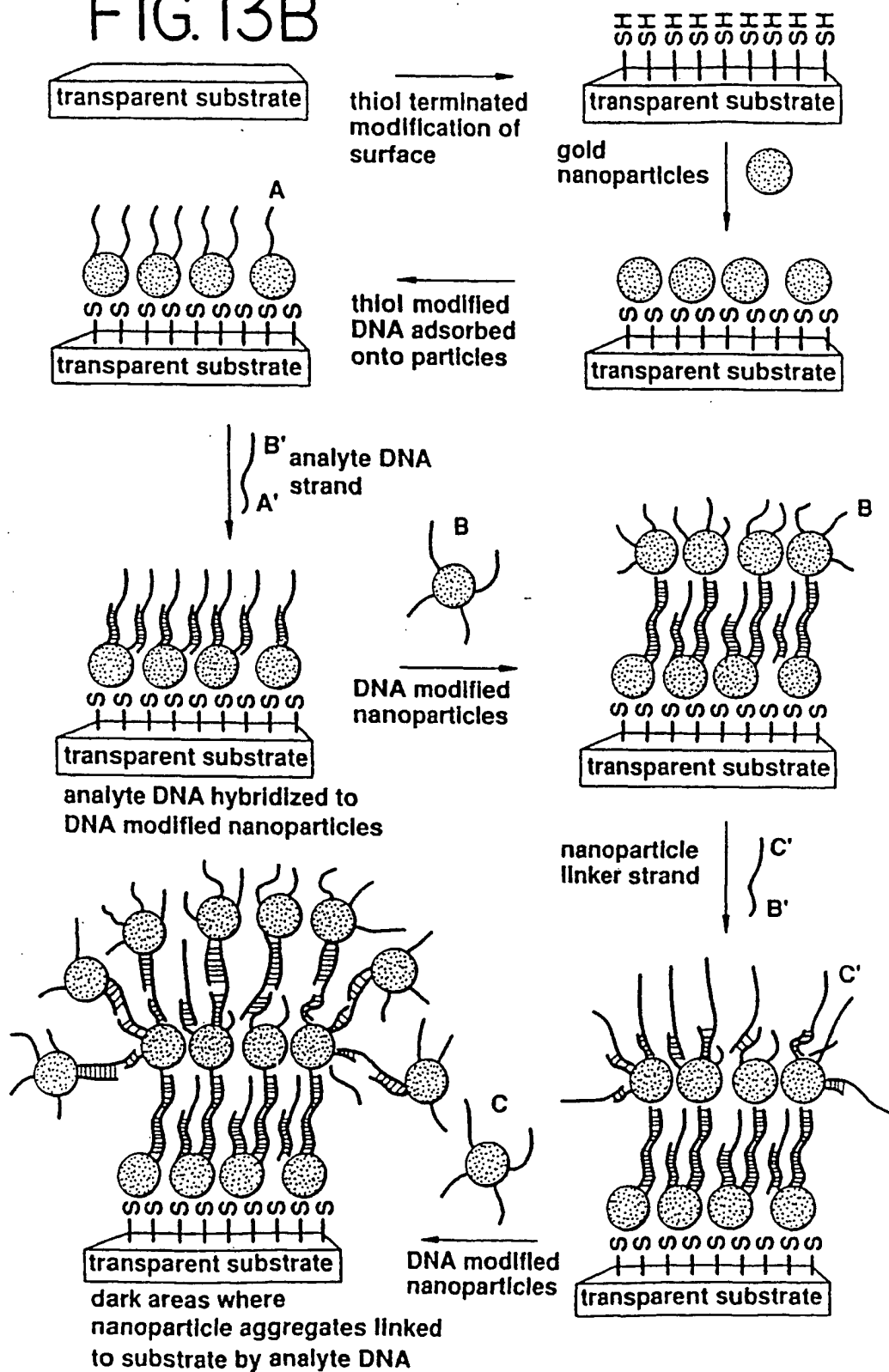


FIG. 14A

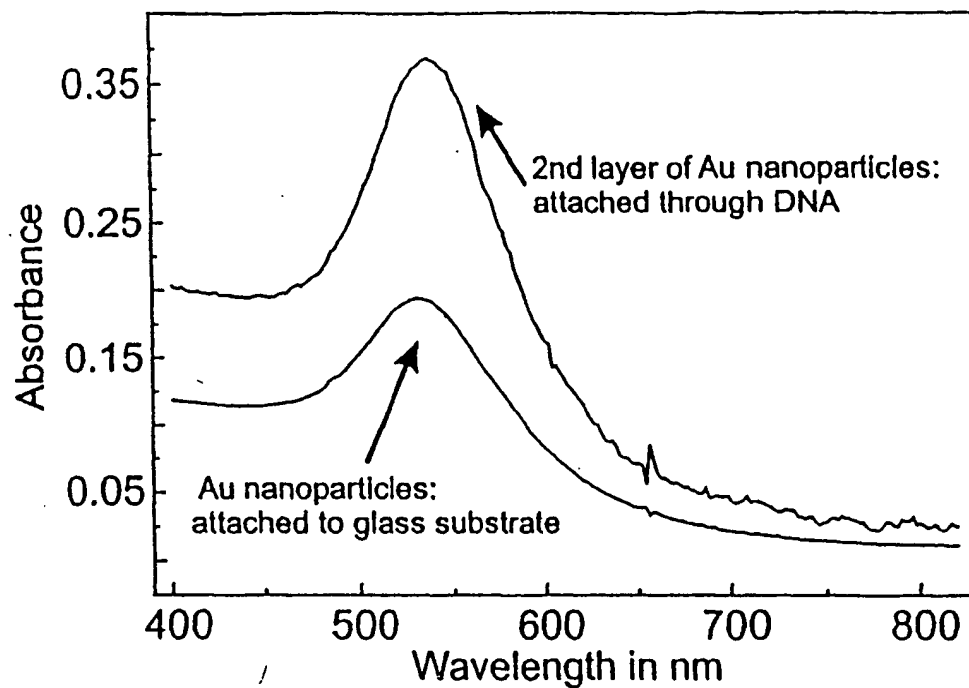


FIG. 14B

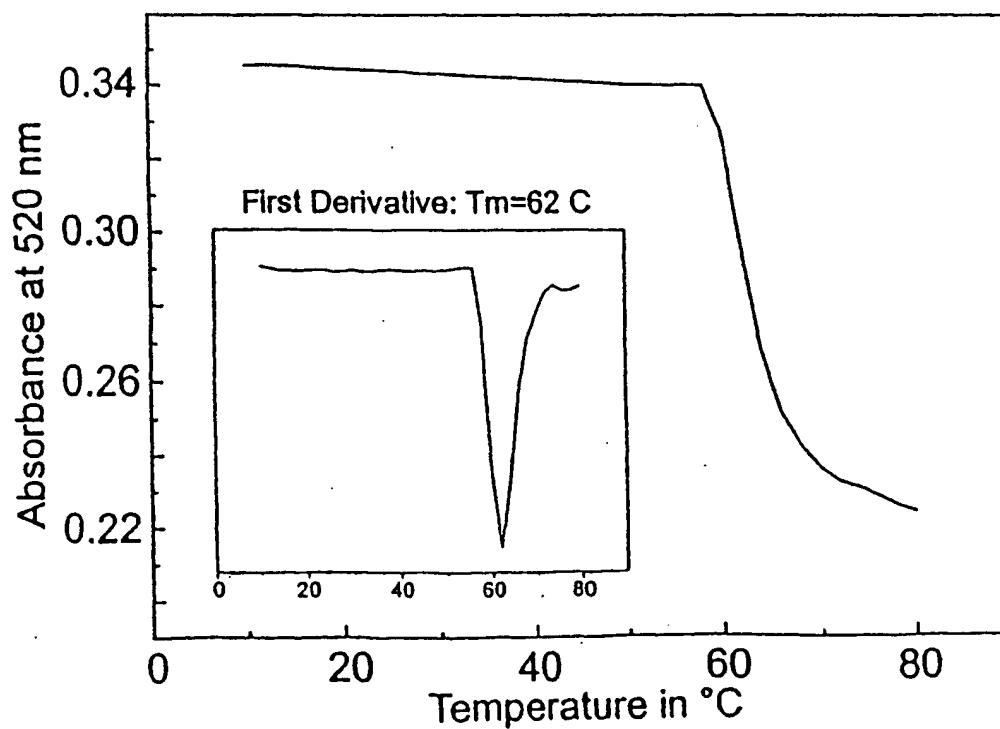


FIG. 15A

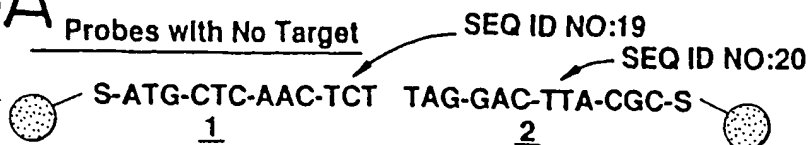


FIG. 15B

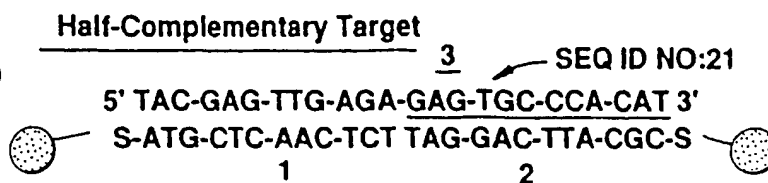


FIG. 15C

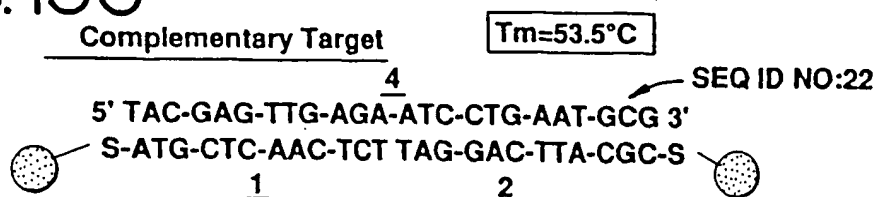


FIG. 15D

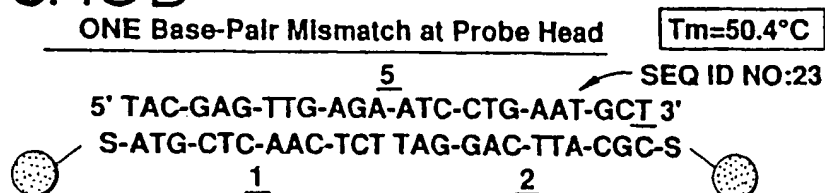


FIG. 15E

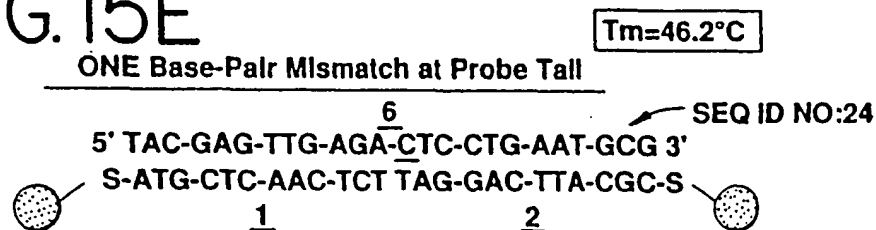


FIG. 15F

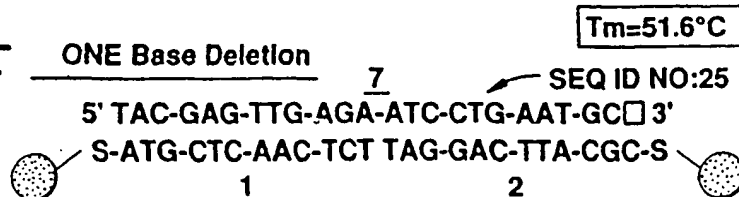
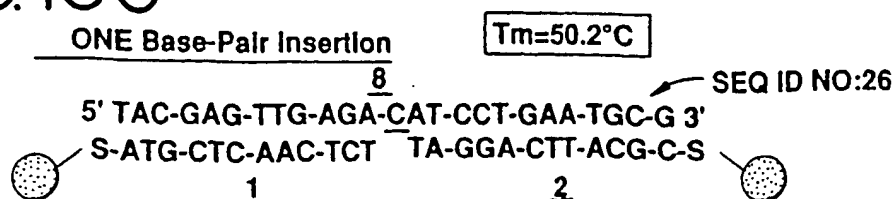


FIG. 15G



24 Base Template

5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GCG 3' —
—S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S —
1 2

48 Base Template with Complementary 24 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-CTG-AAT-GCG 3' —
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S —

FIG. 16C

72 Base Template with Complementary 48 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG-3'
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-ATA-TAA-CCT-GCG-AAA-TGC-CTG-TTG TAG-GAC-TTA-CGC-S—

FIG. 17A

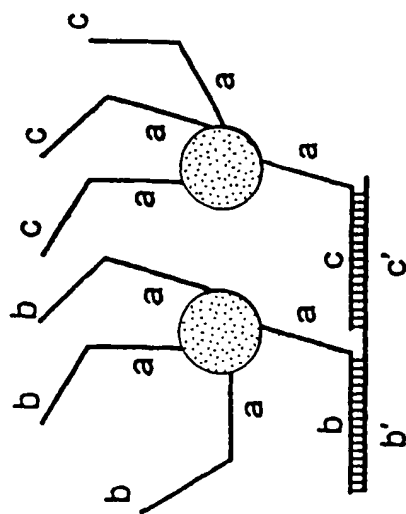


FIG. 17B

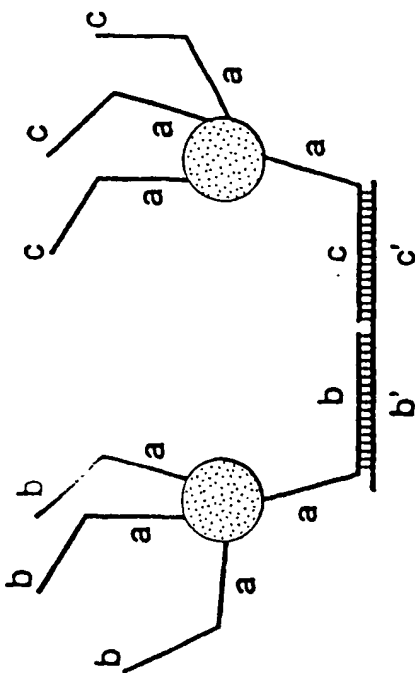


FIG. 17C

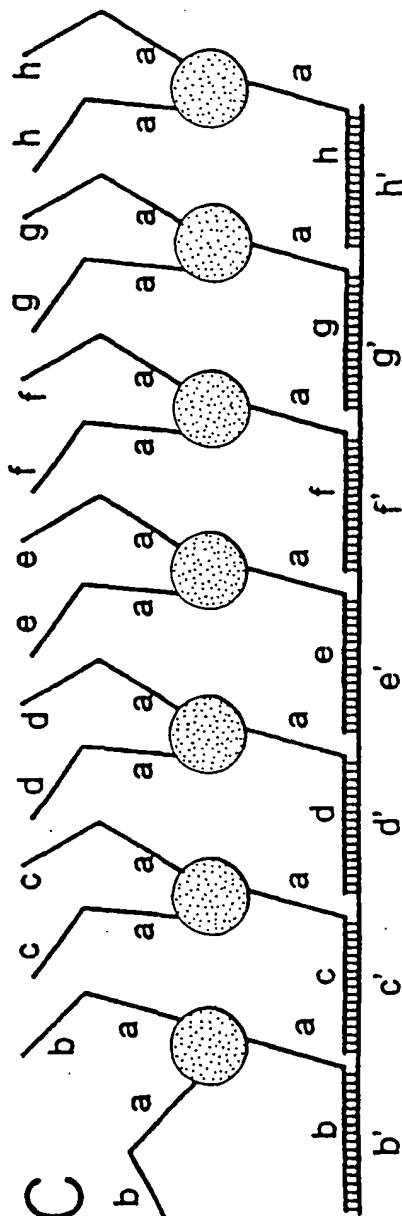


FIG. 17D

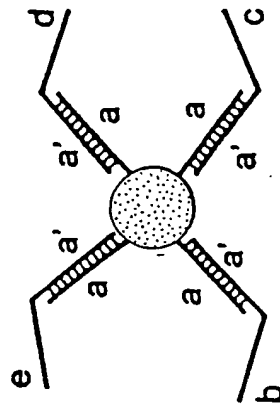
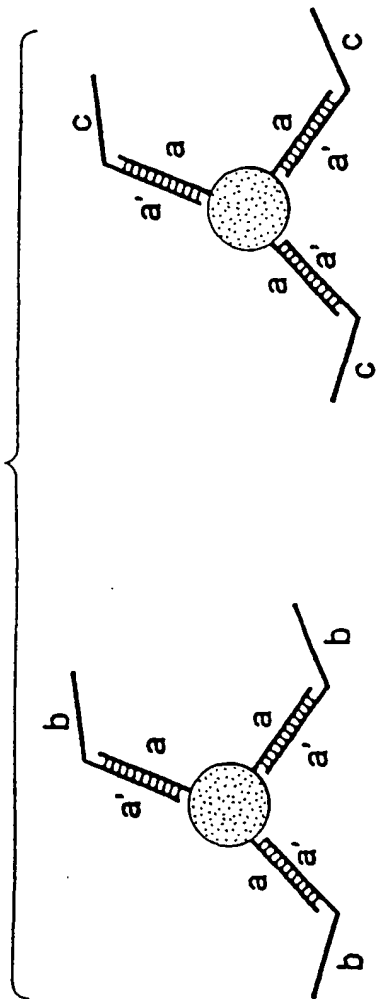


FIG. 17E

FIG. 18

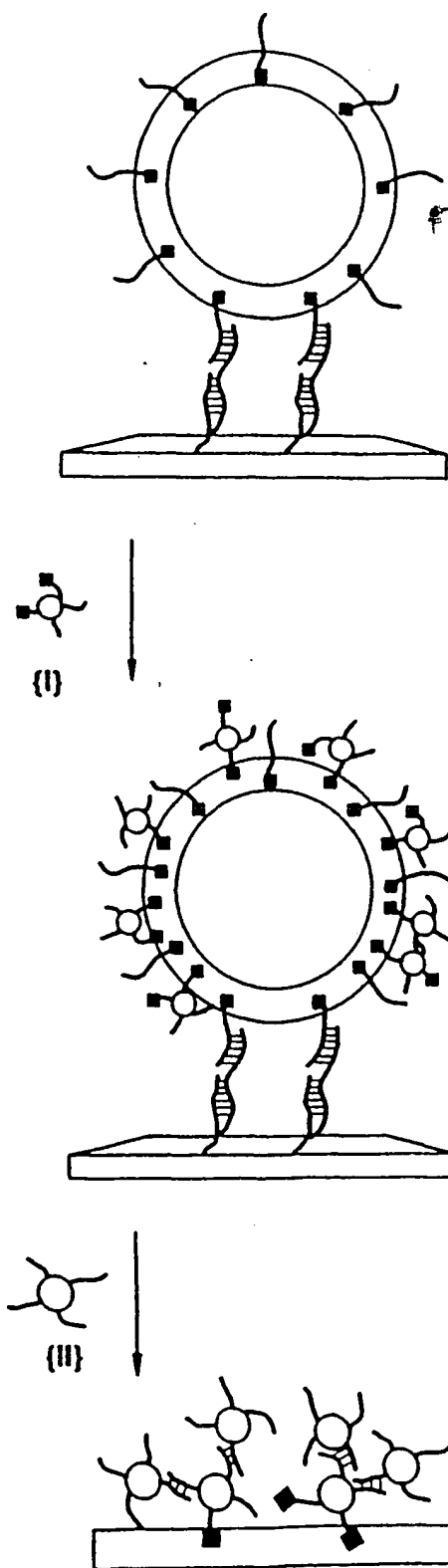


FIG. 19A

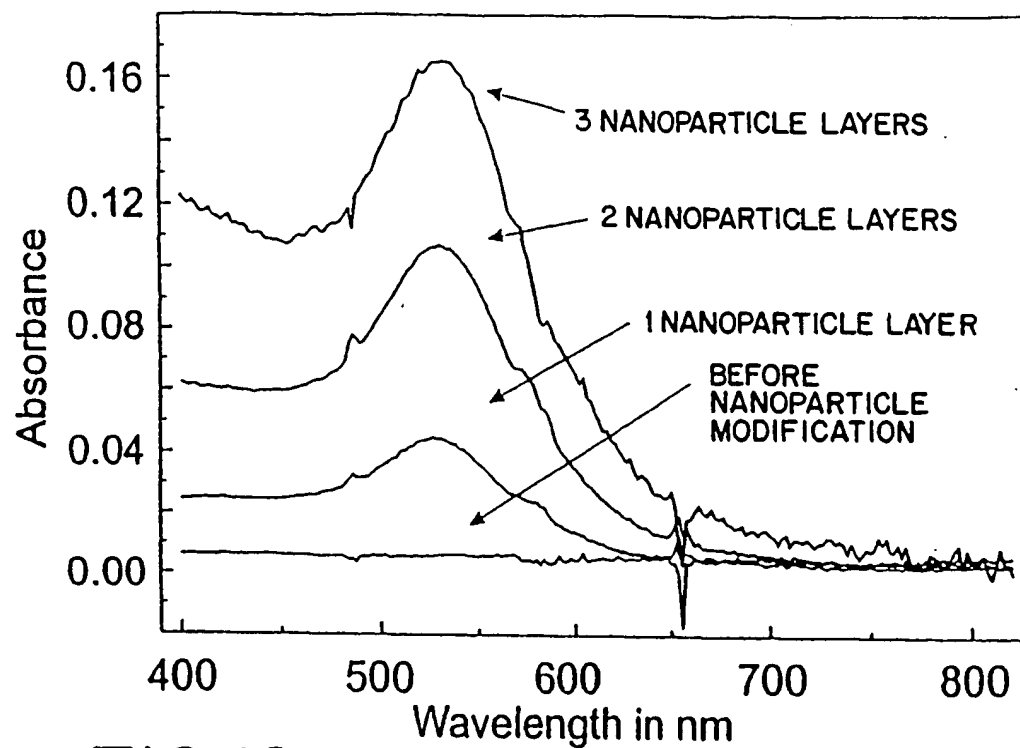


FIG. 19B

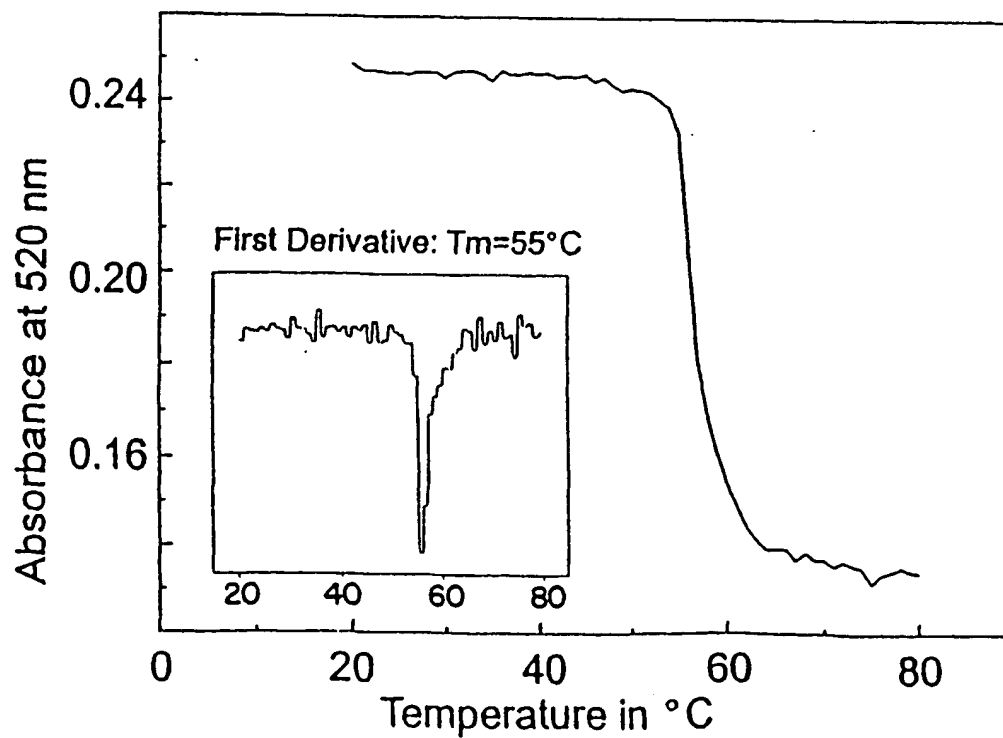


FIG. 20A

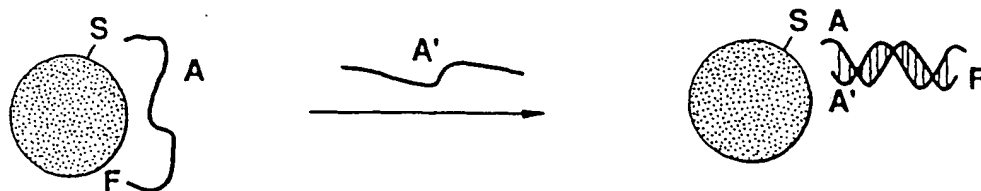


FIG. 20B

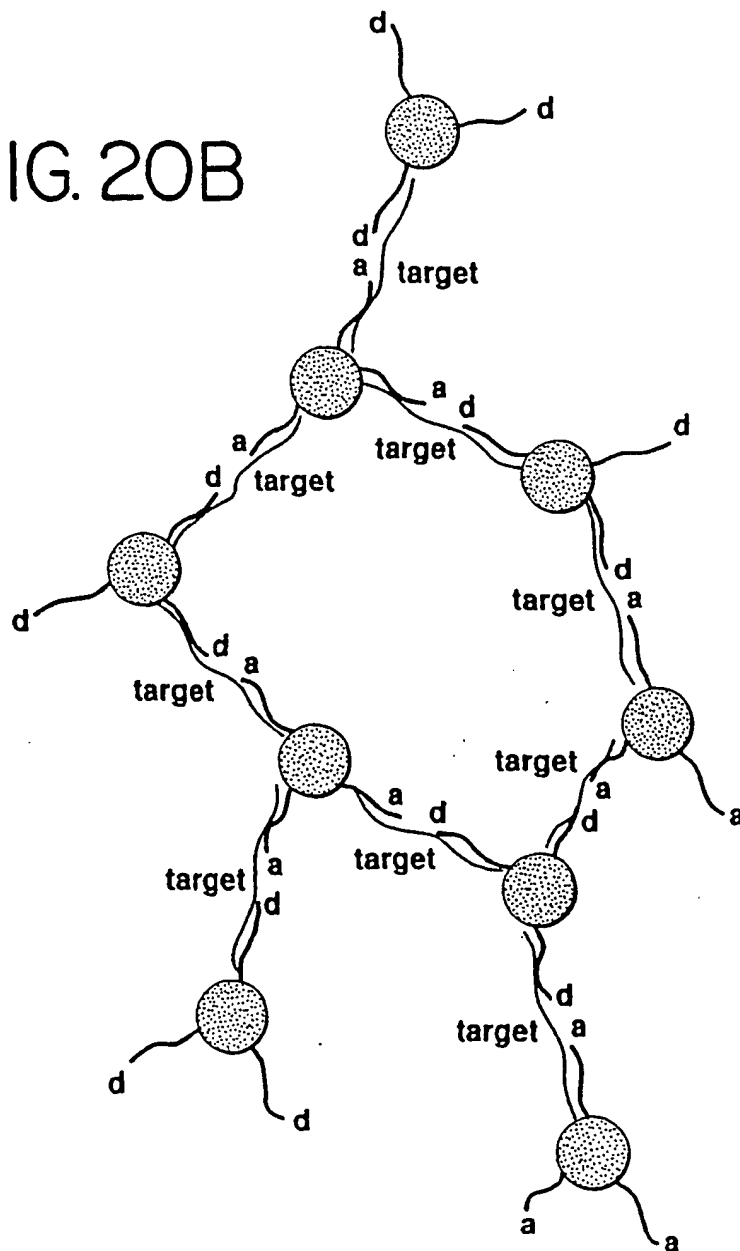


FIG. 2I

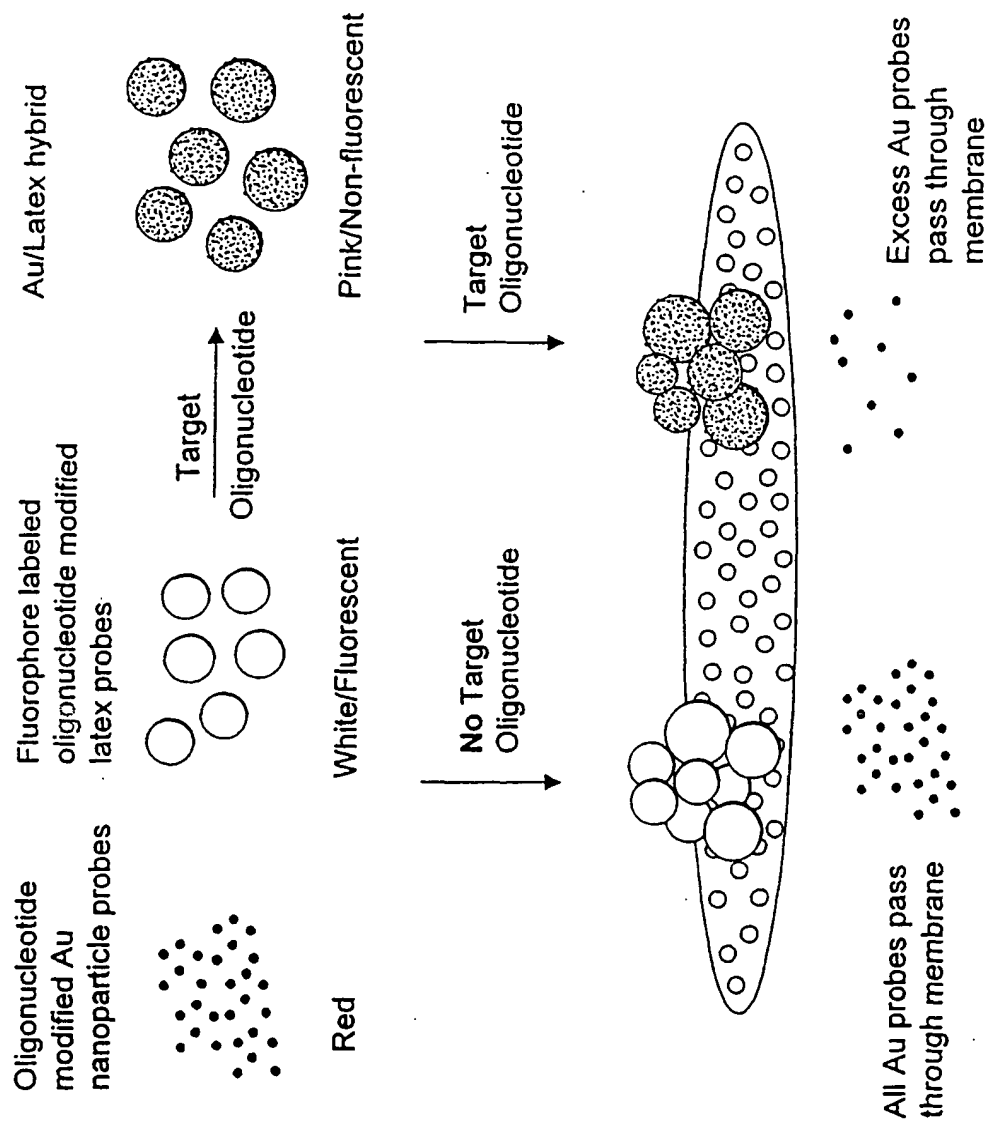


FIG. 22

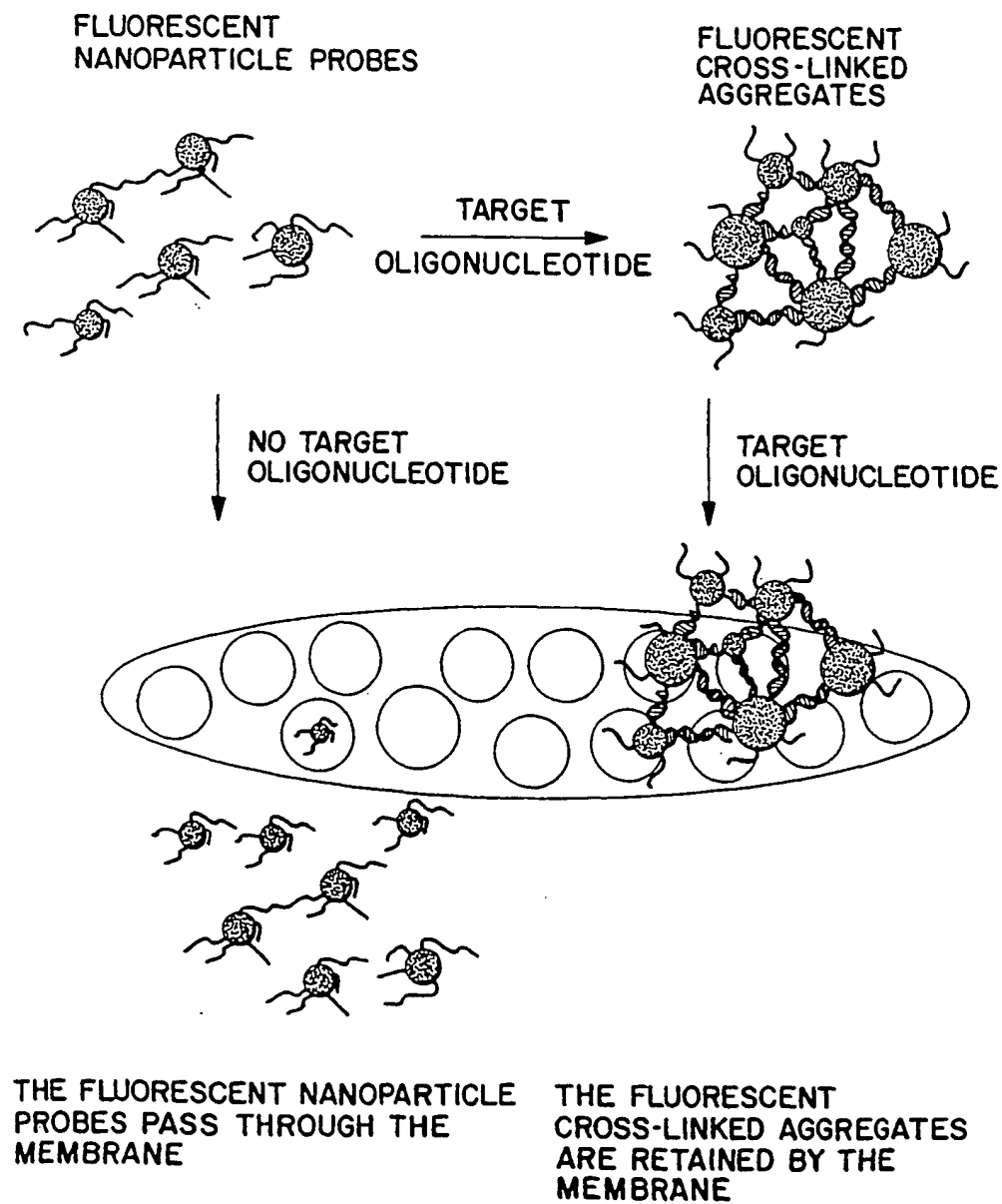


FIG. 23

Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT
3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA
AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3'
TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

141 mer Anthrax PCR product [SEQ ID NO:36]



[SEQ ID NO:37]



[SEQ ID NO:38]

Oligonucleotide-Nanoparticle Probes

Blocker Oligonucleotides

3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT
3' A TCT CTT CAT TAA TTA AGC AGT TGT
3' TAT TCT TTT TAT AAT AGG TCC CAA TAT
3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA

[SEQ ID NO:39]

[SEQ ID NO:40]

[SEQ ID NO:41]

[SEQ ID NO:42]

FIG. 24

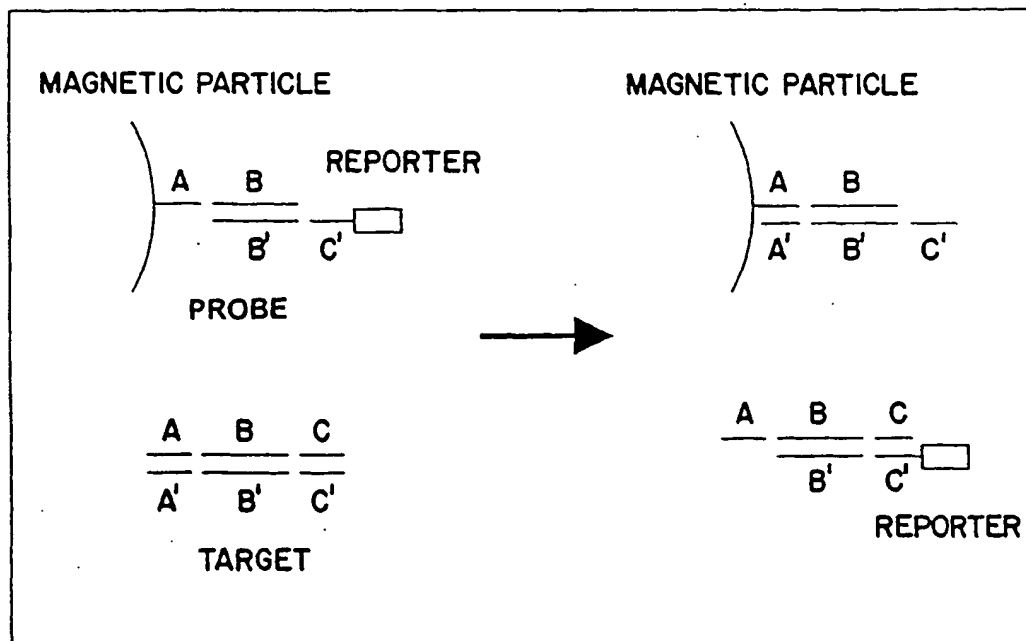
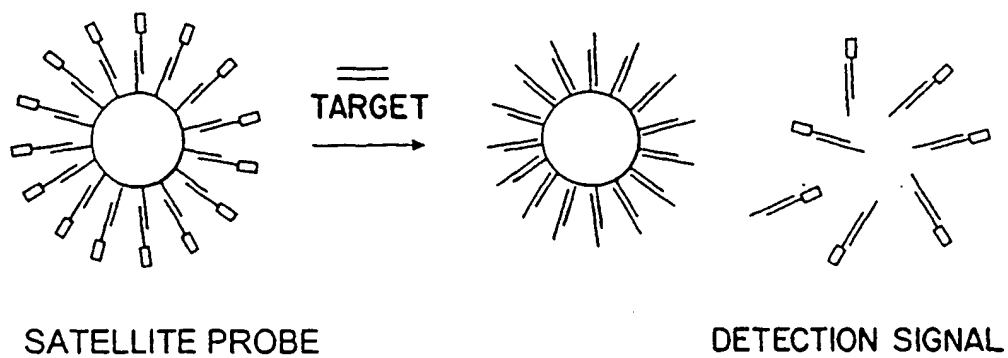


FIG. 25A

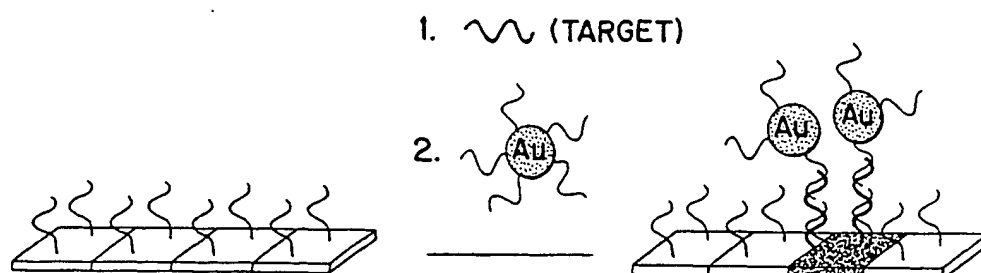


FIG. 25B

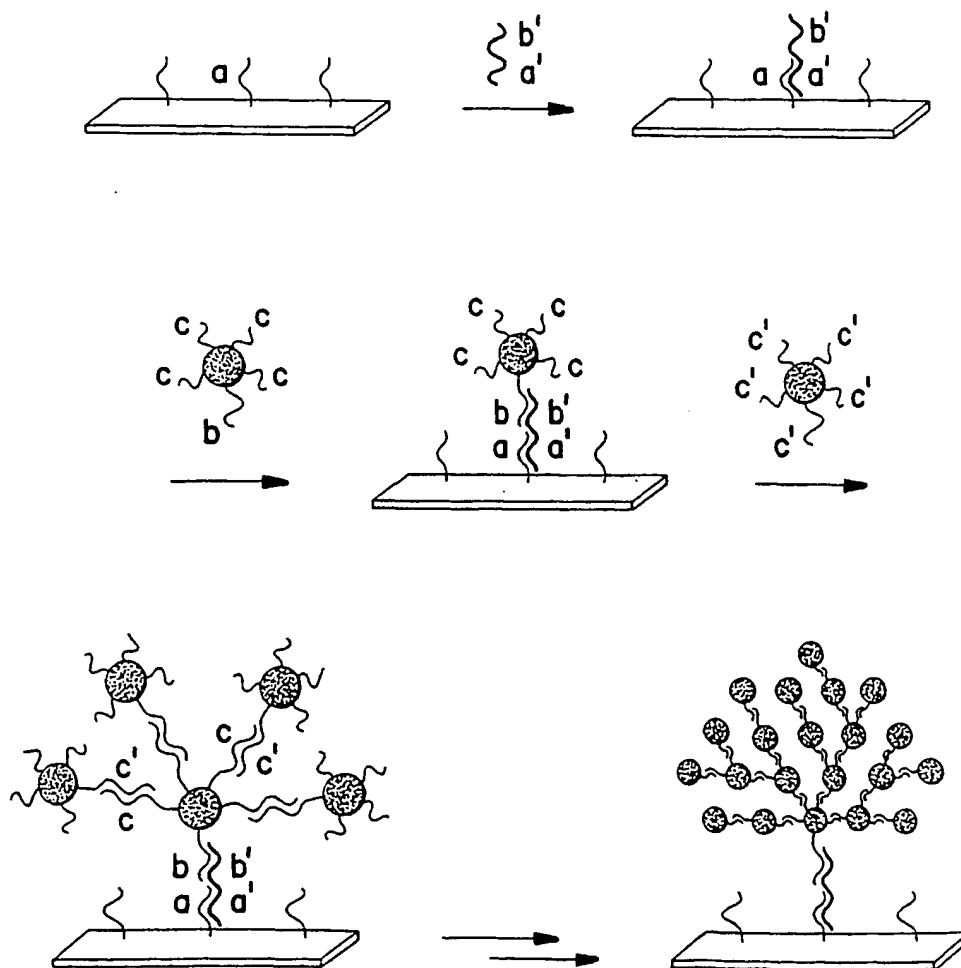


FIG. 26A

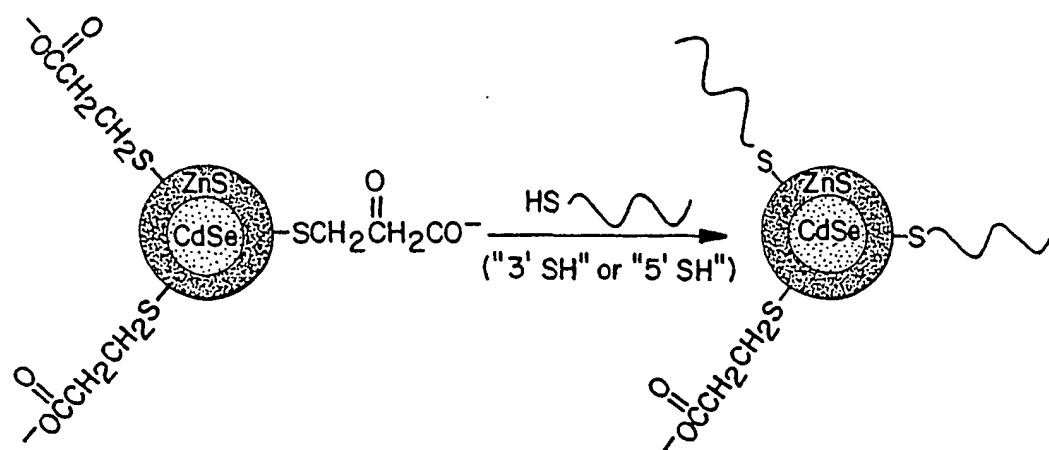


FIG. 26B

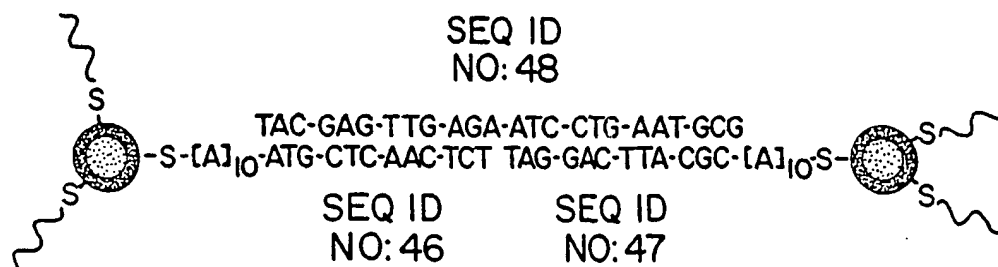


FIG. 27A

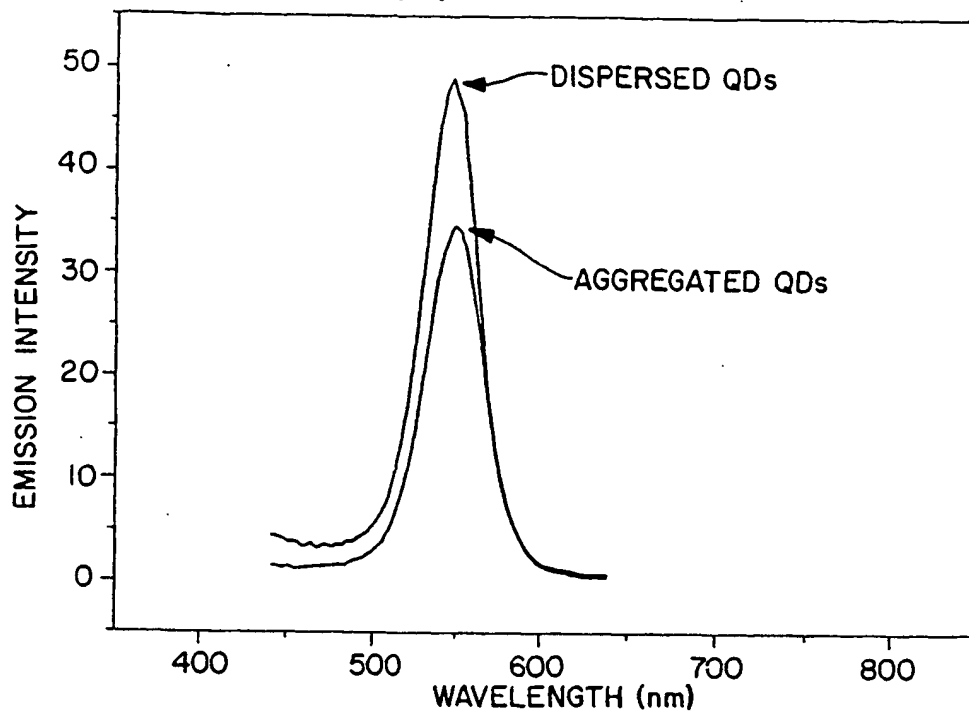


FIG. 27B

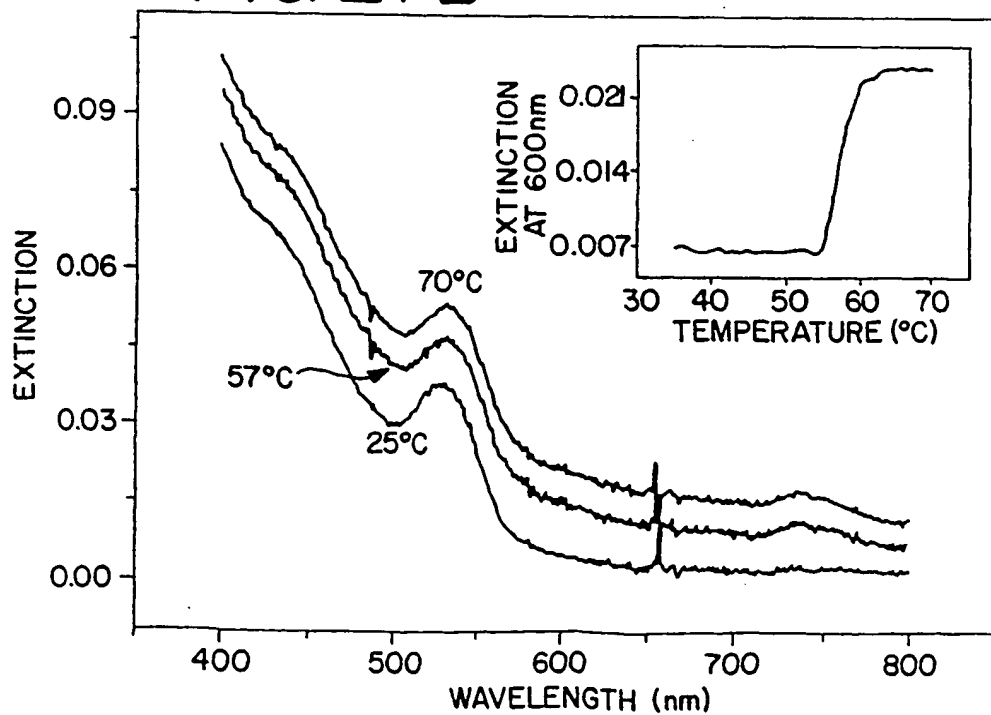


FIG. 27C

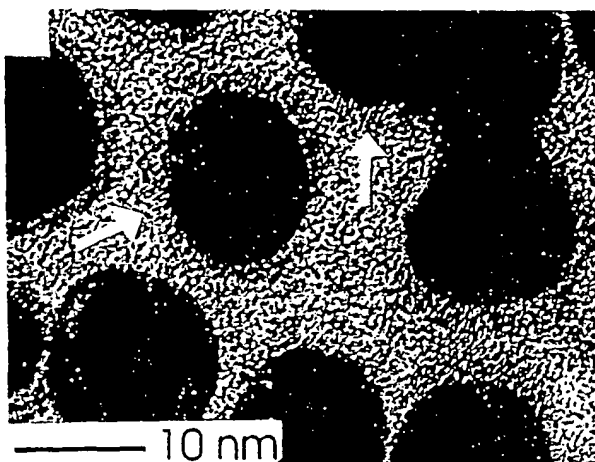


FIG. 27D

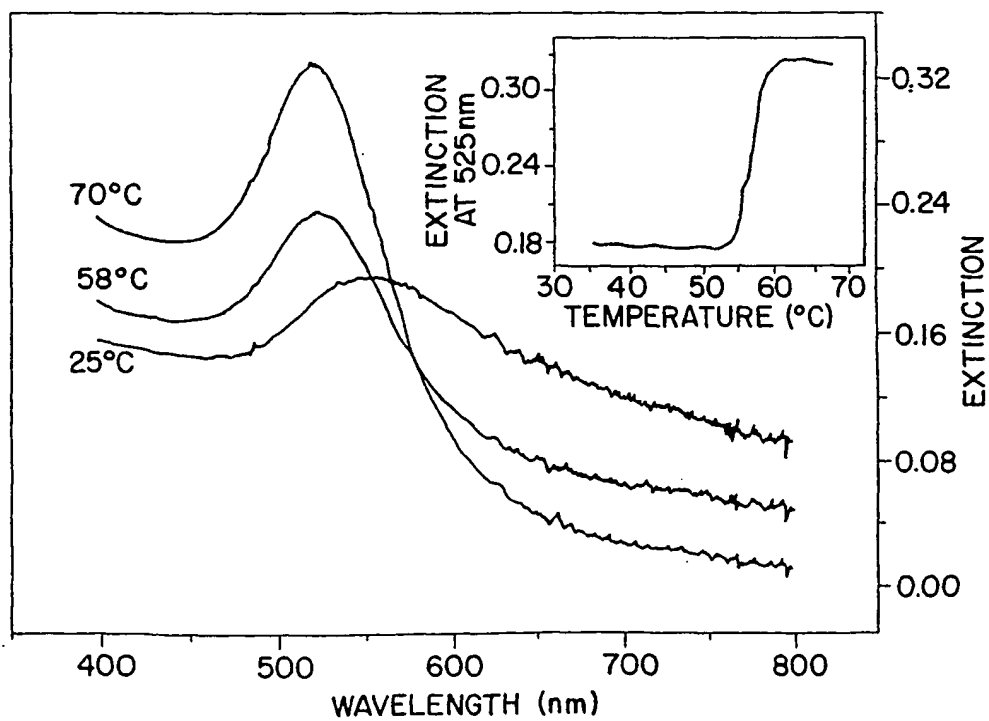


FIG. 28A

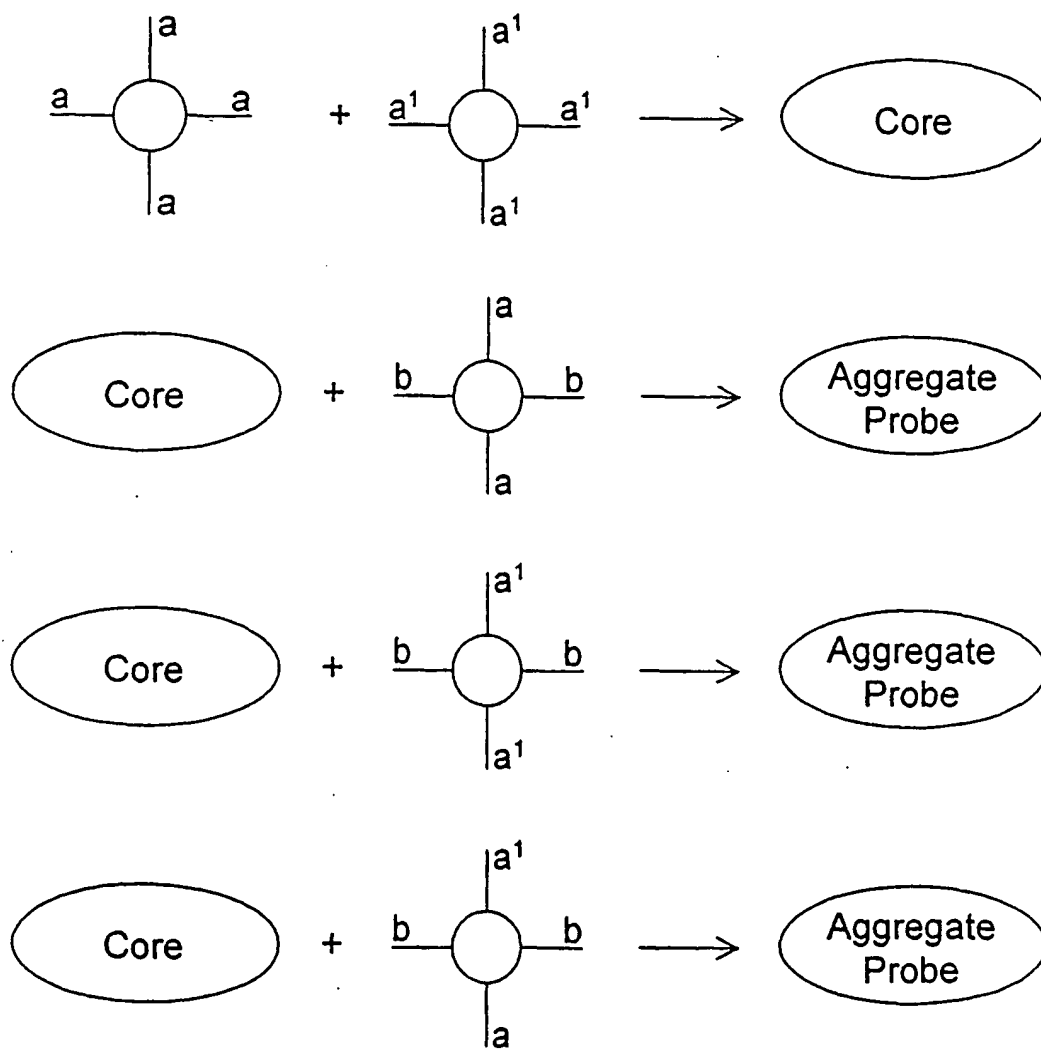


FIG. 28B

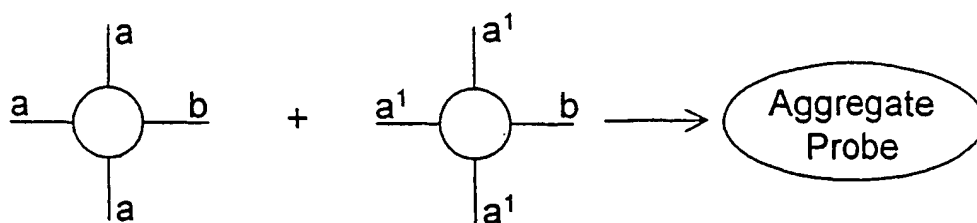


FIG. 28C

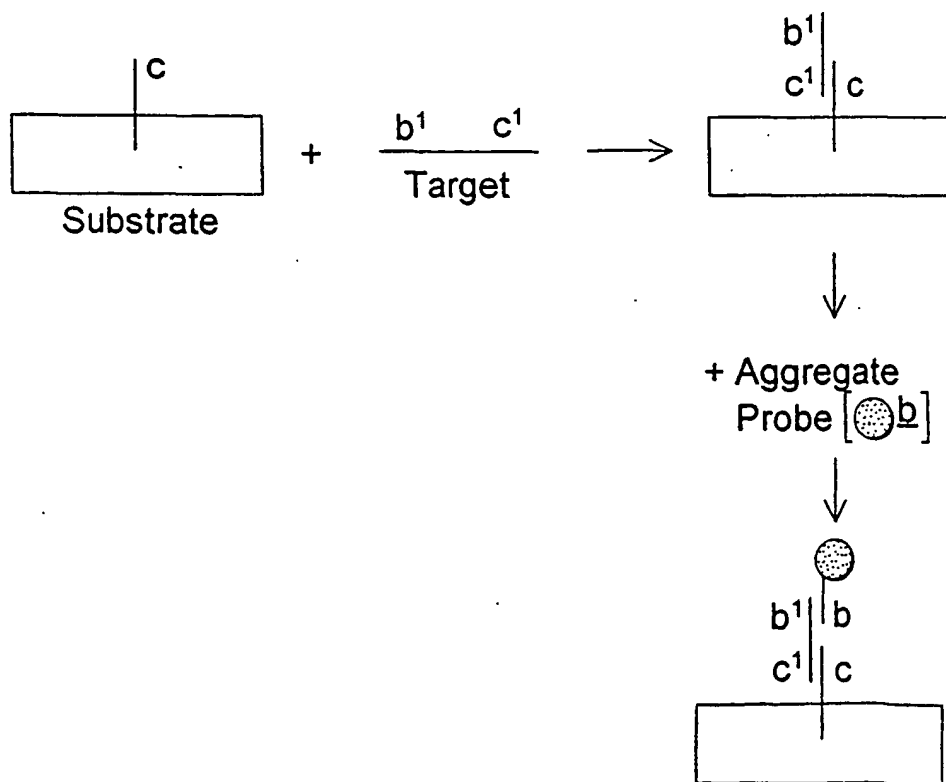


FIG. 28D

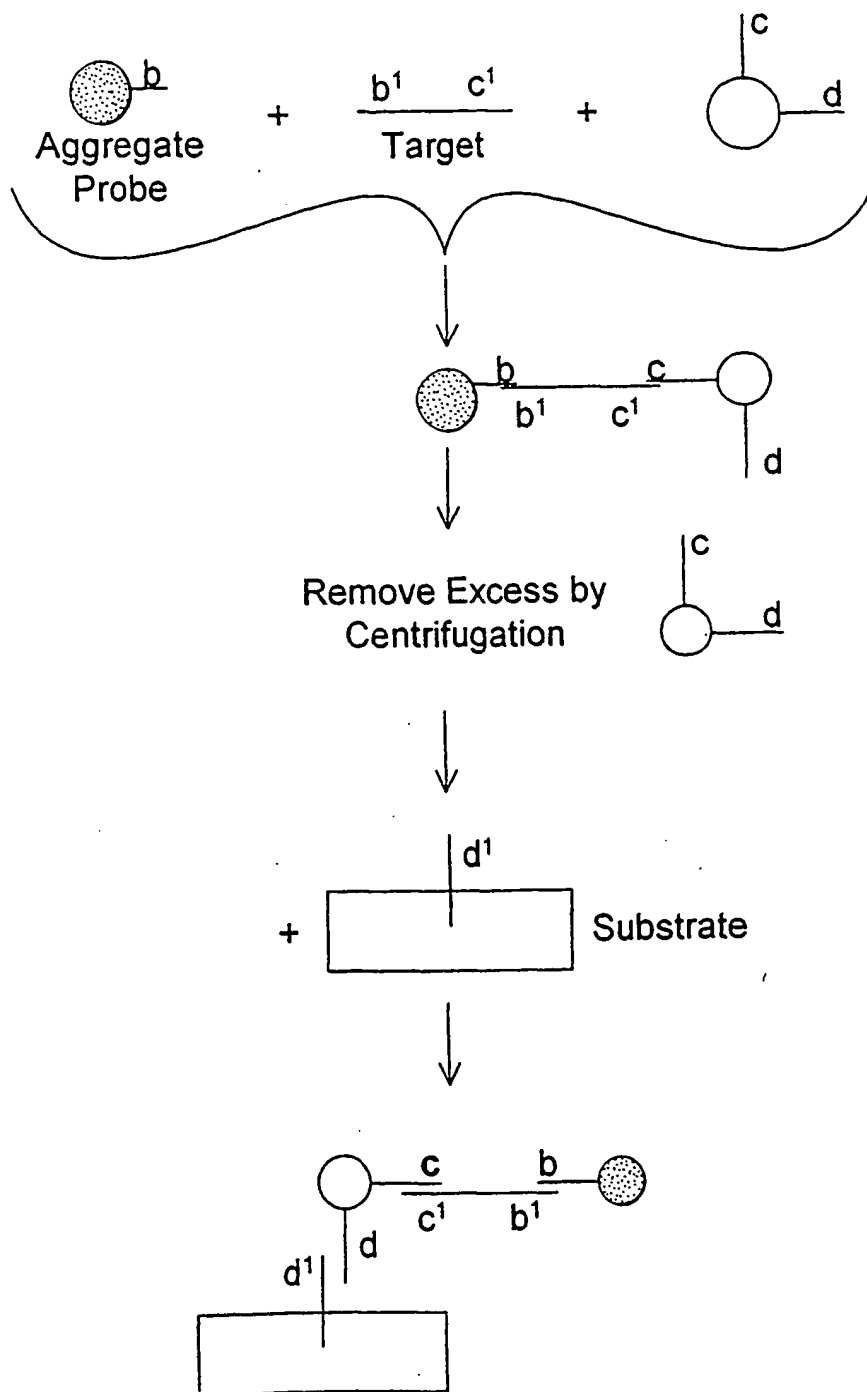
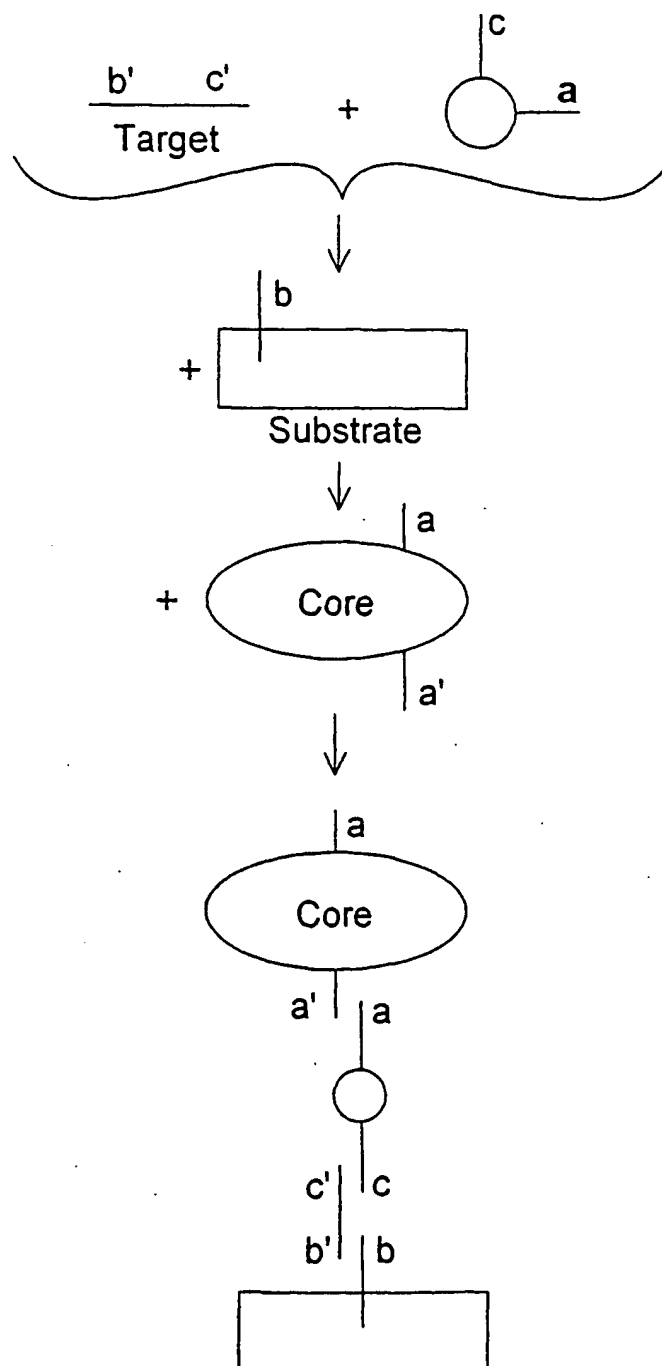


FIG. 28E



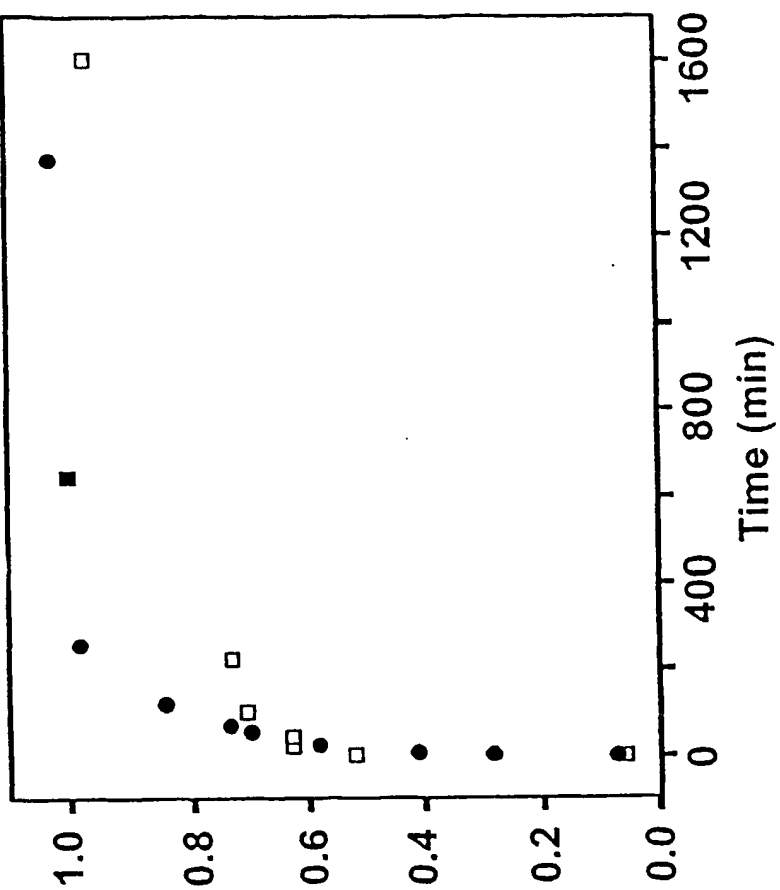


FIG. 29

Fractional Displacement by ME

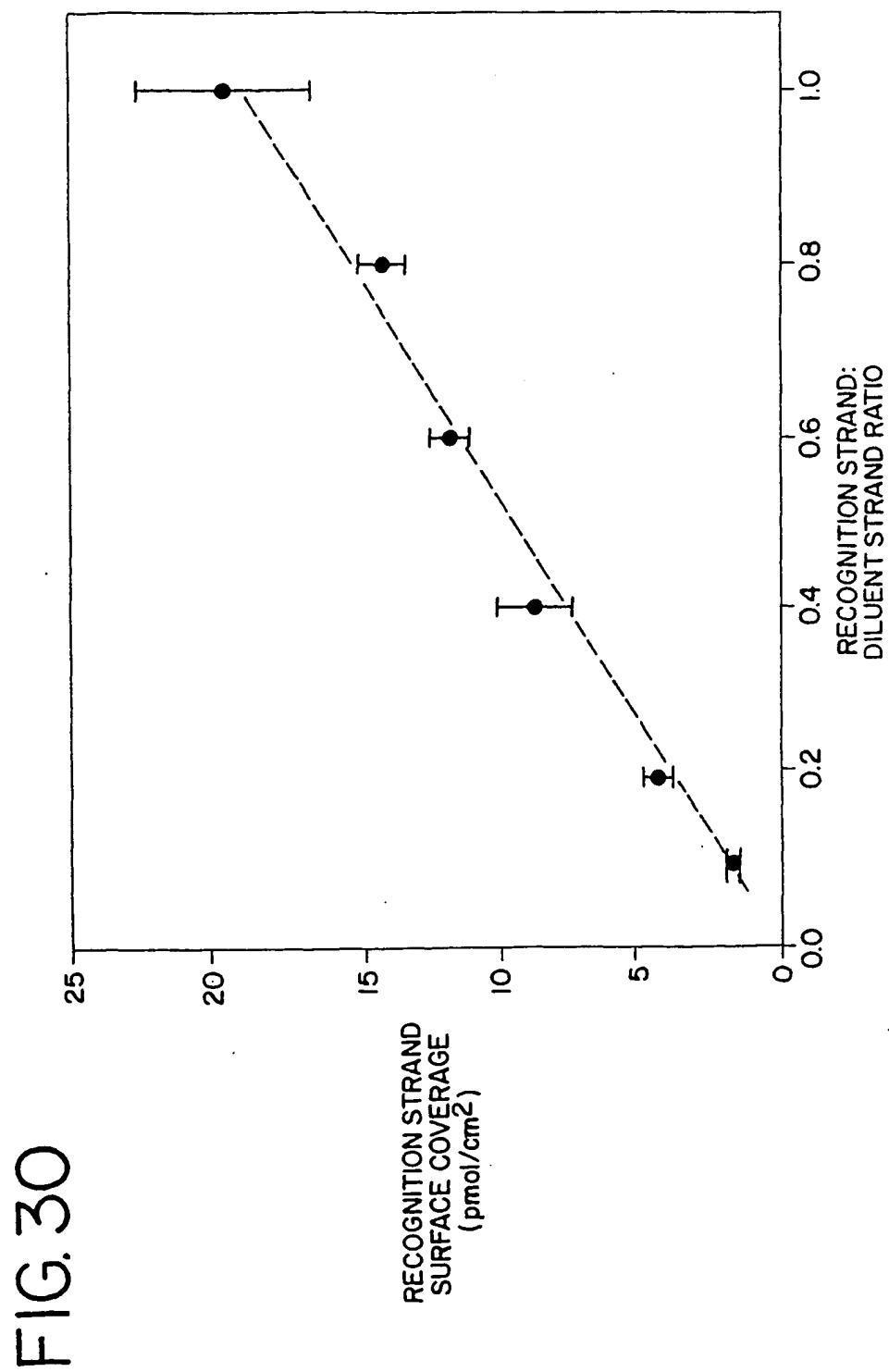


FIG. 31

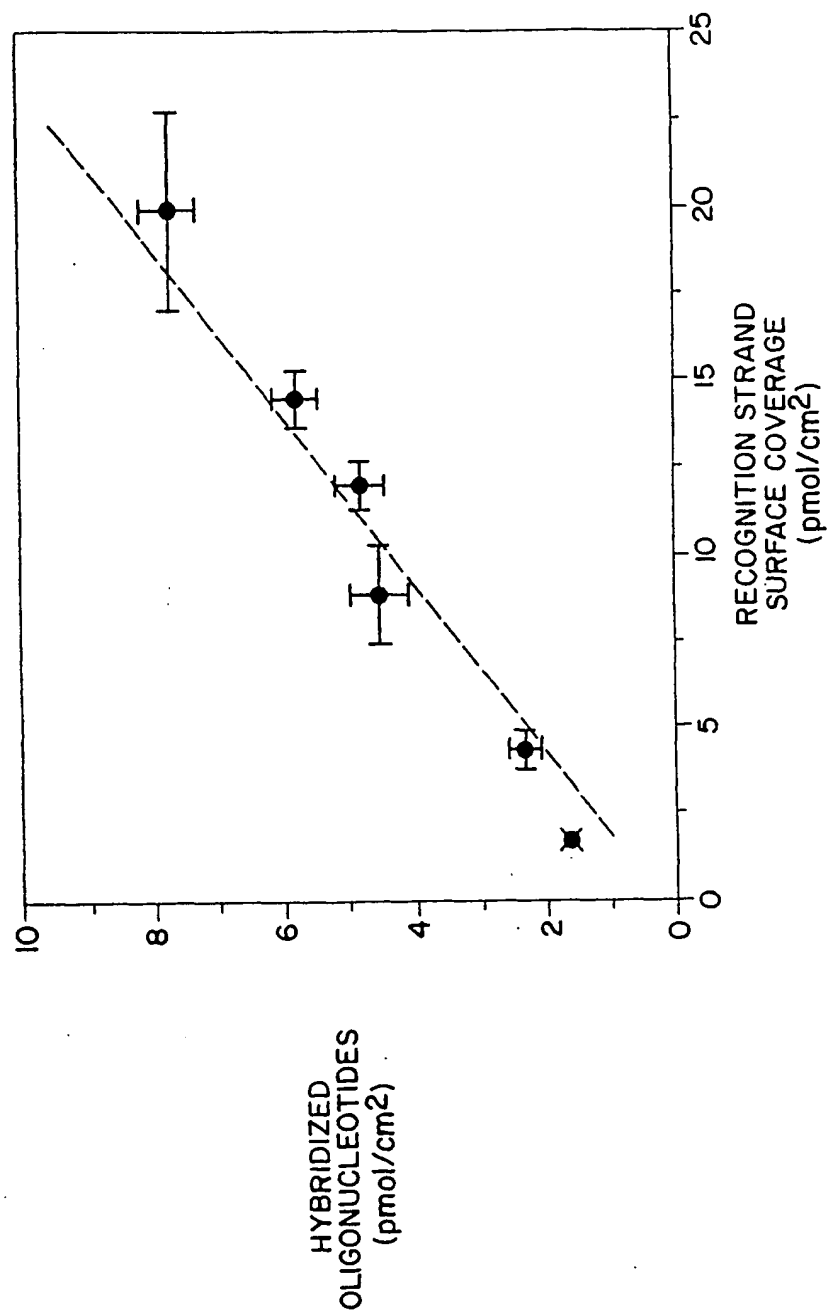
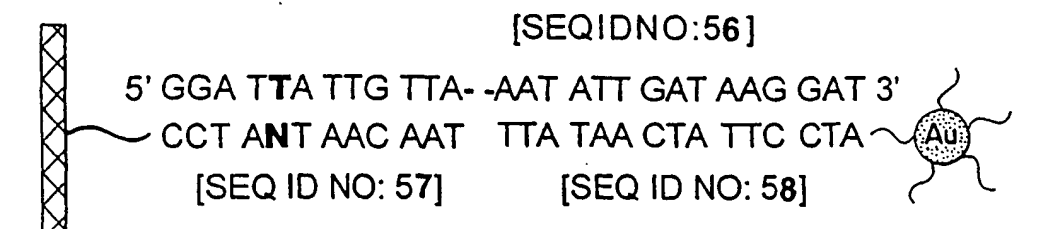


FIG. 32



N = A (complementary),
G,C,T (mismatched)

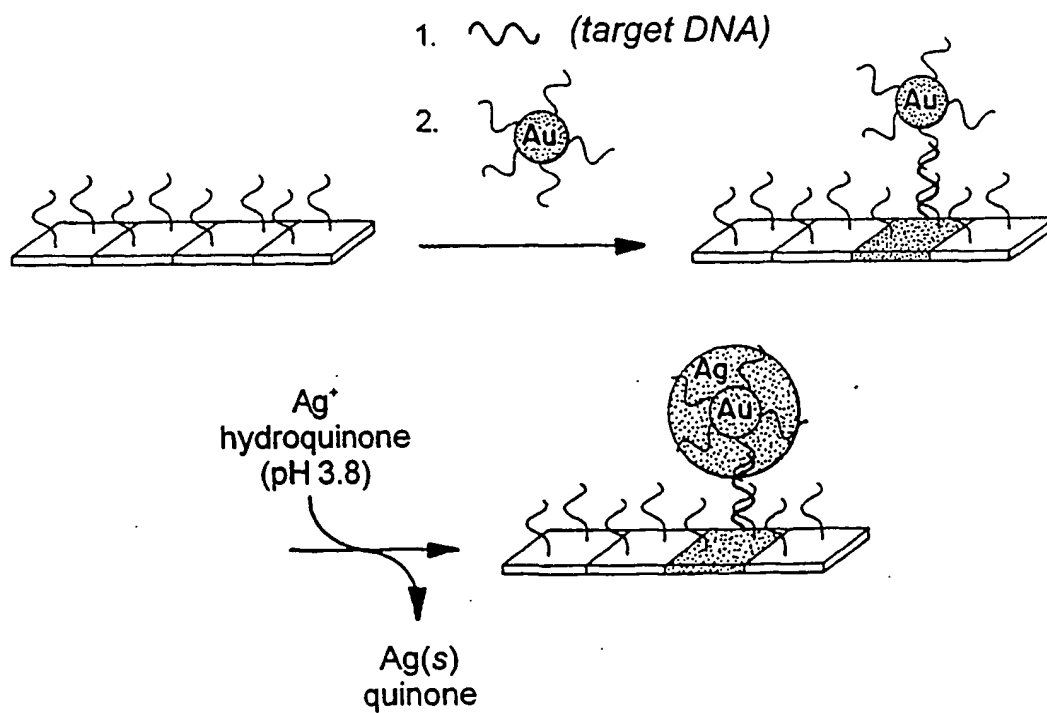


FIG. 33

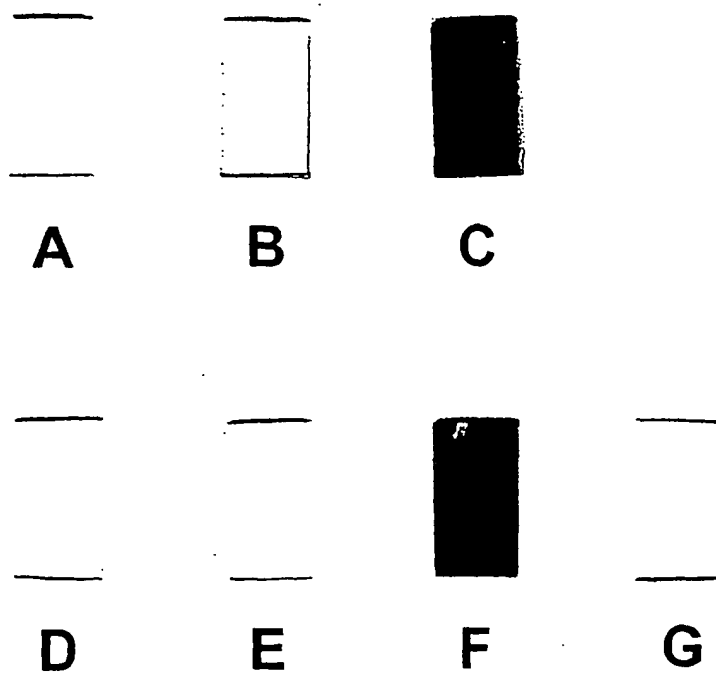


FIG. 34

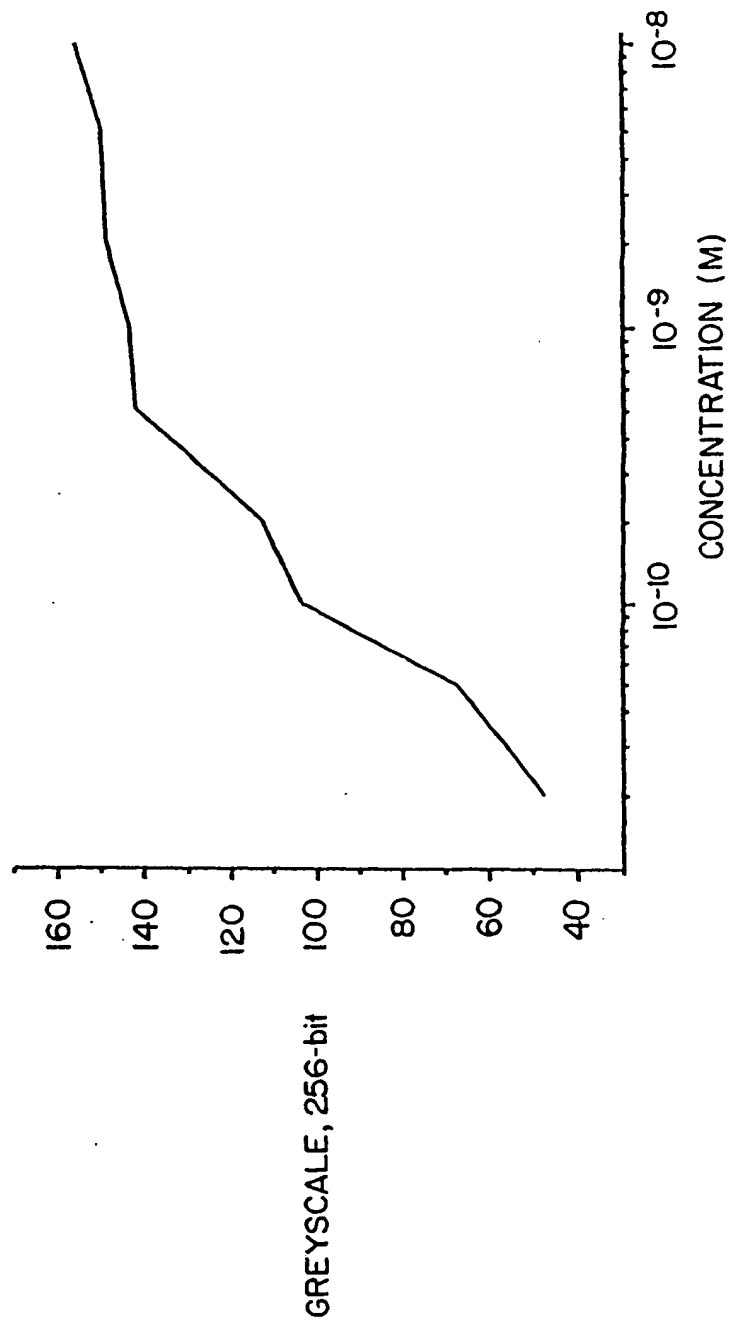


FIG. 35A

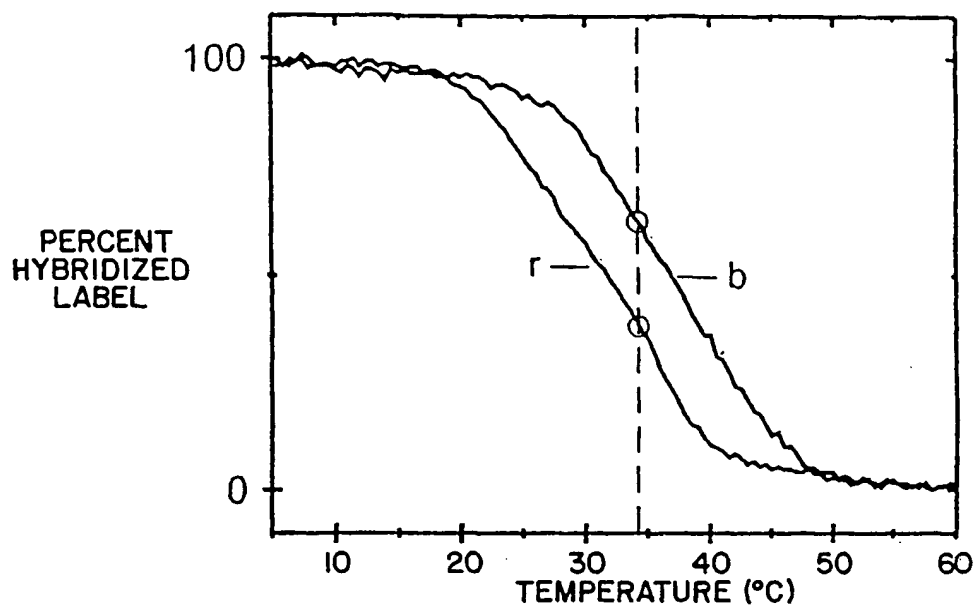


FIG. 35B

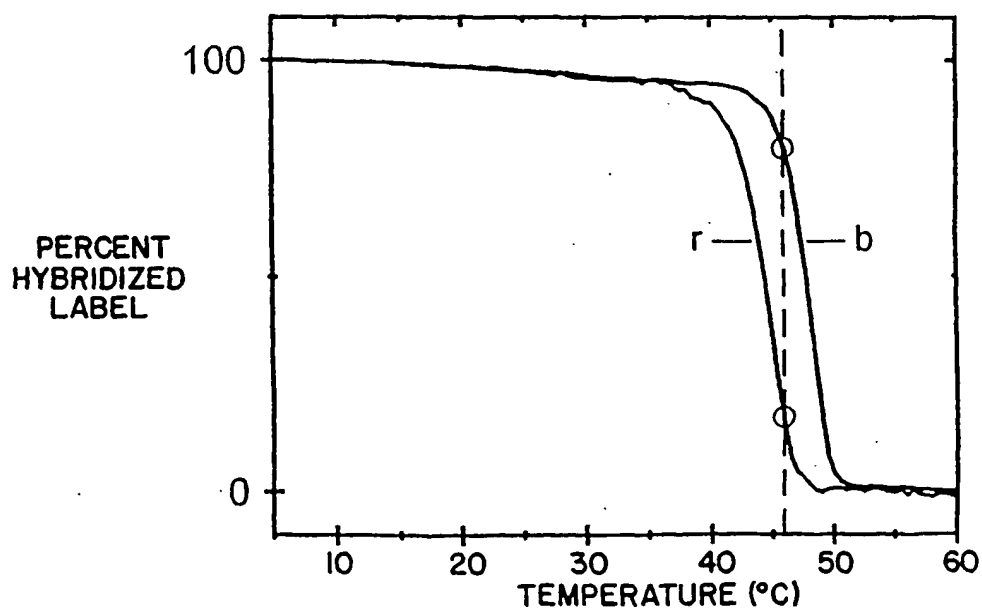


FIG. 36A

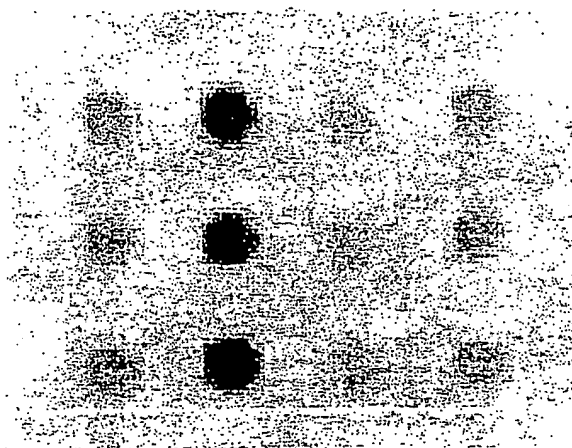
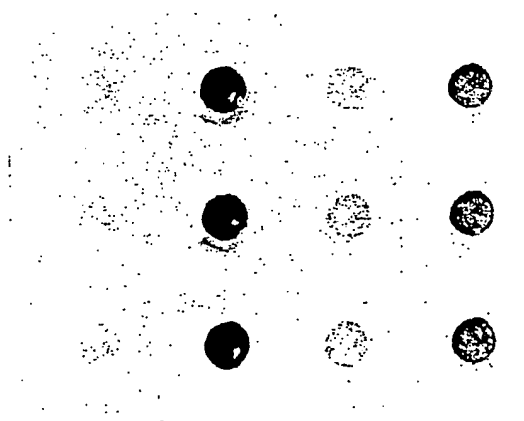


FIG. 36B



C A T G

FIG.37A

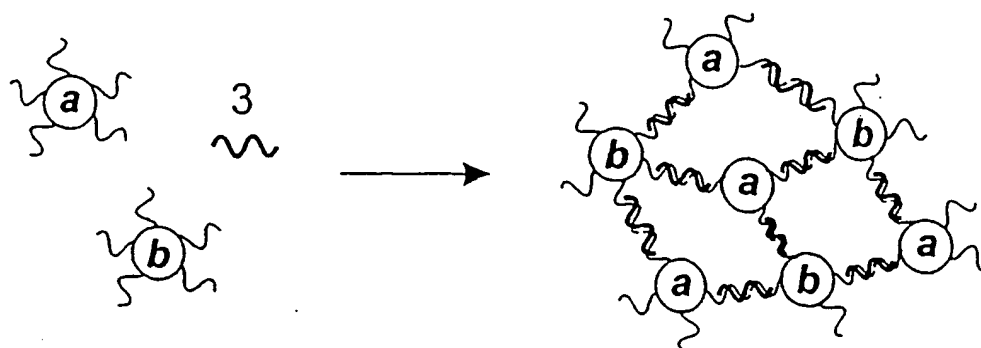
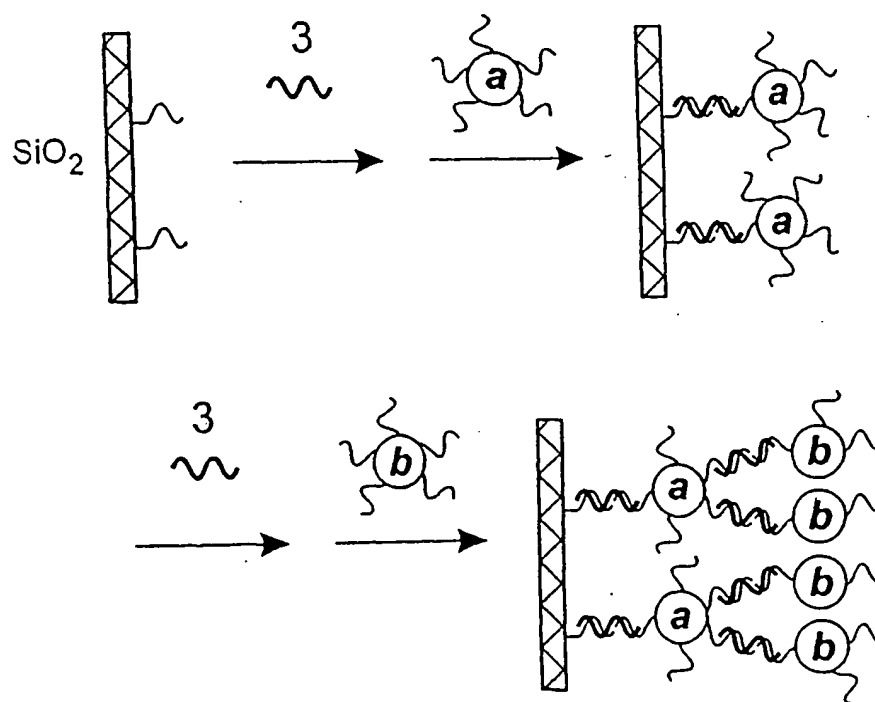


FIG.37B



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FIG. 38A

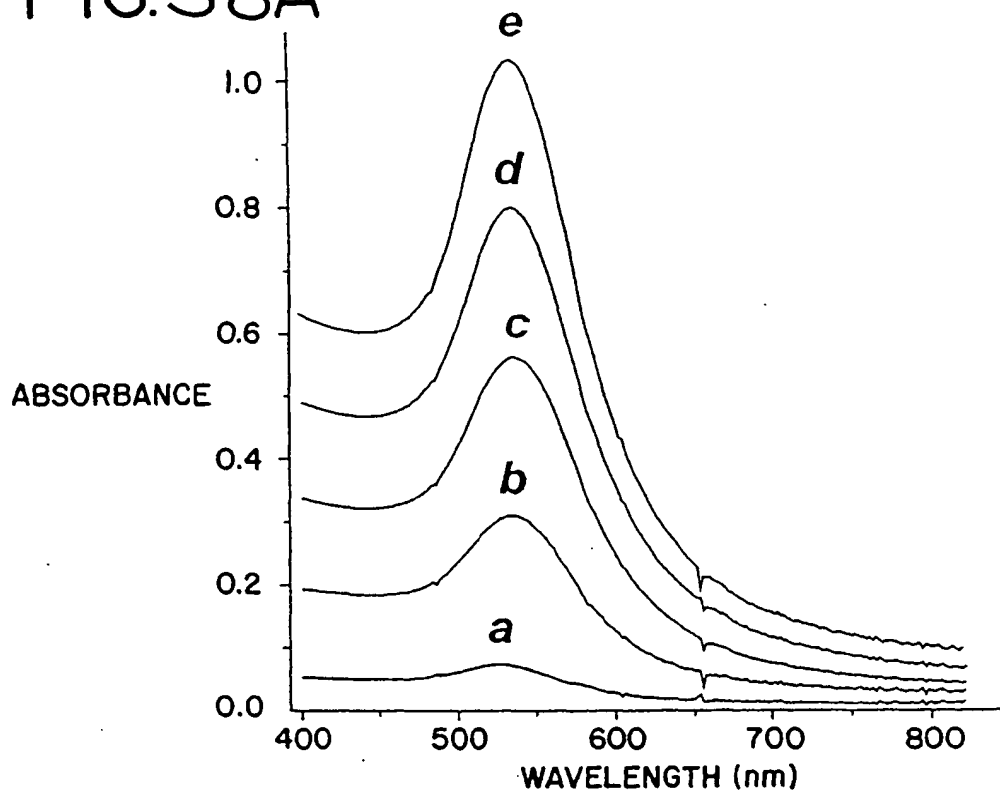


FIG. 38B

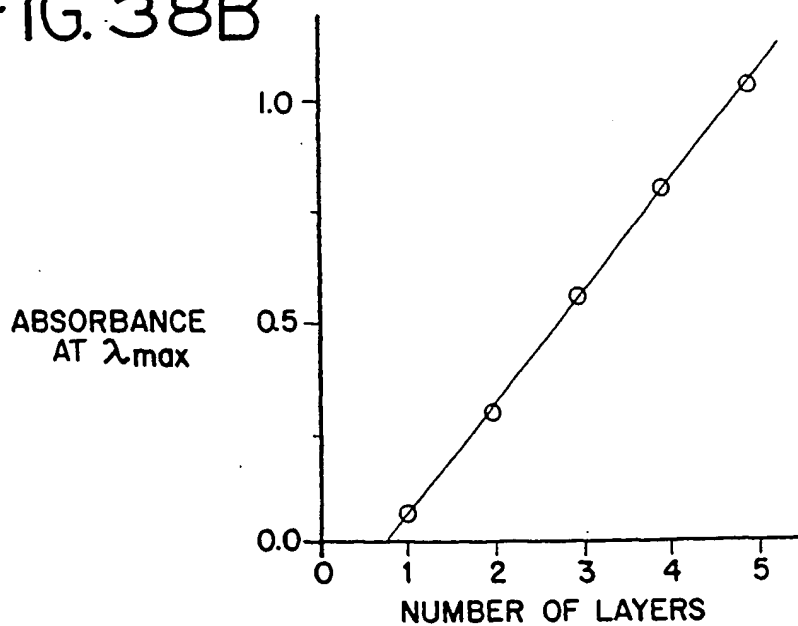


FIG. 39A

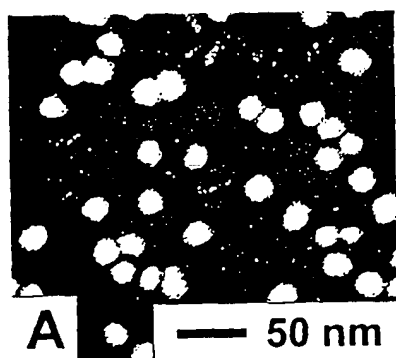


FIG. 39B

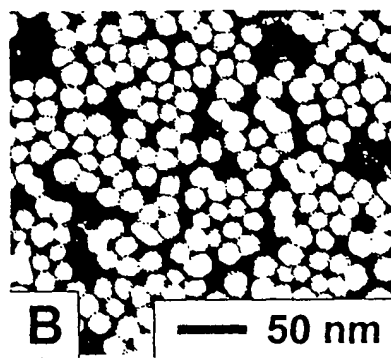


FIG.39C

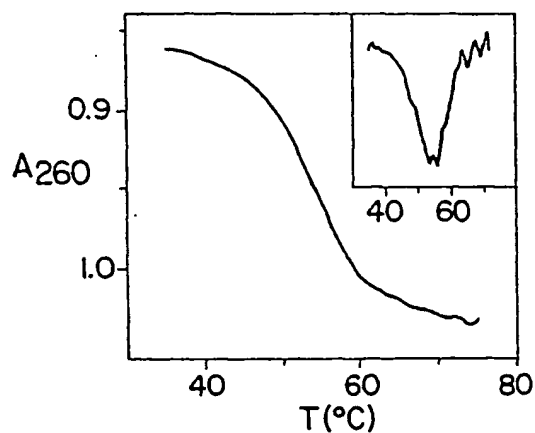


FIG.39D

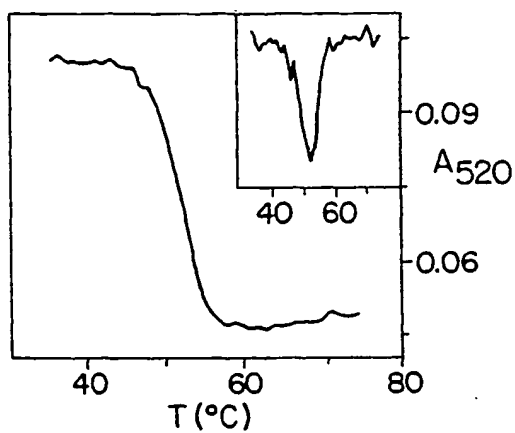


FIG.39E

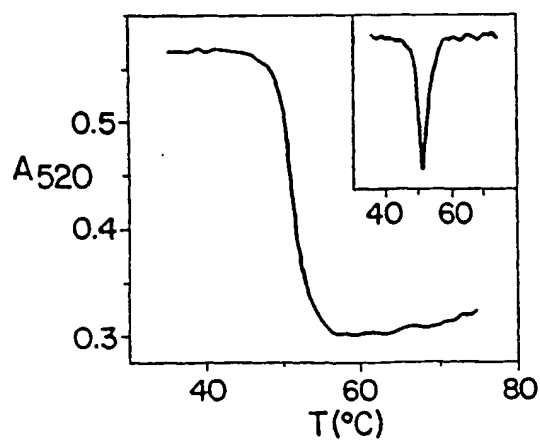


FIG.39F

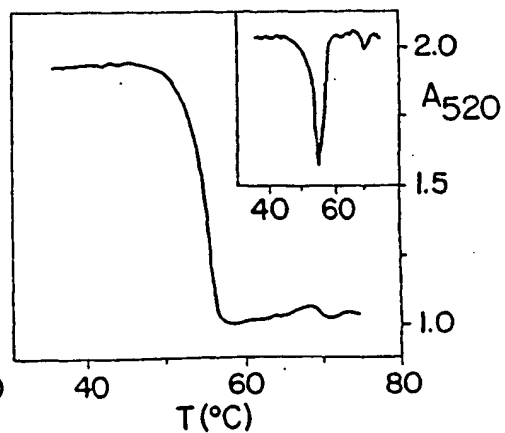


FIG. 40

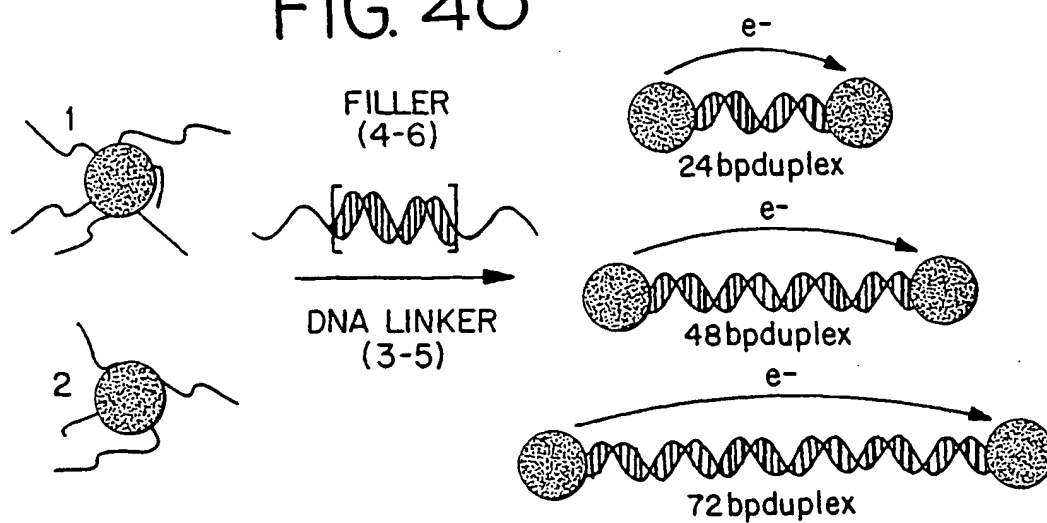


FIG. 41

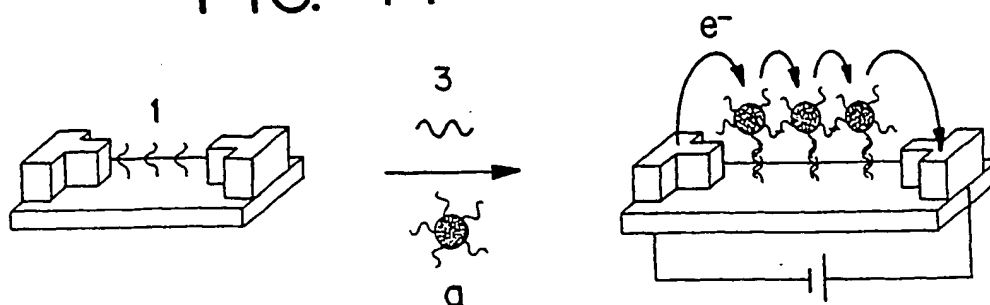
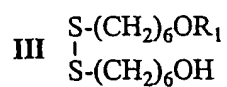
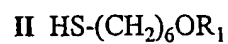
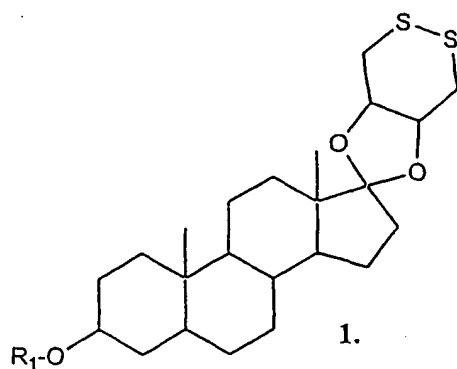


FIG. 42



R₁

a = H

b = (iPr)₂NP(OCH₂CH₂CN)-

c1 = 5'-p(A₂₀)-TATCGTTCCATCAGCT [SEQ ID NO: 65]

c2 = 5'-p(A₂₀)-TTGATCTTCGTTCT [SEQ ID NO: 66]

Target I = 79-mer oligonucleotide with target region:

3'-.....ATAGCAAGGTAGTCGAGCAACTAGAAAGGCAAGA.....5'
[SEQ ID NO: 67]

FIG. 43

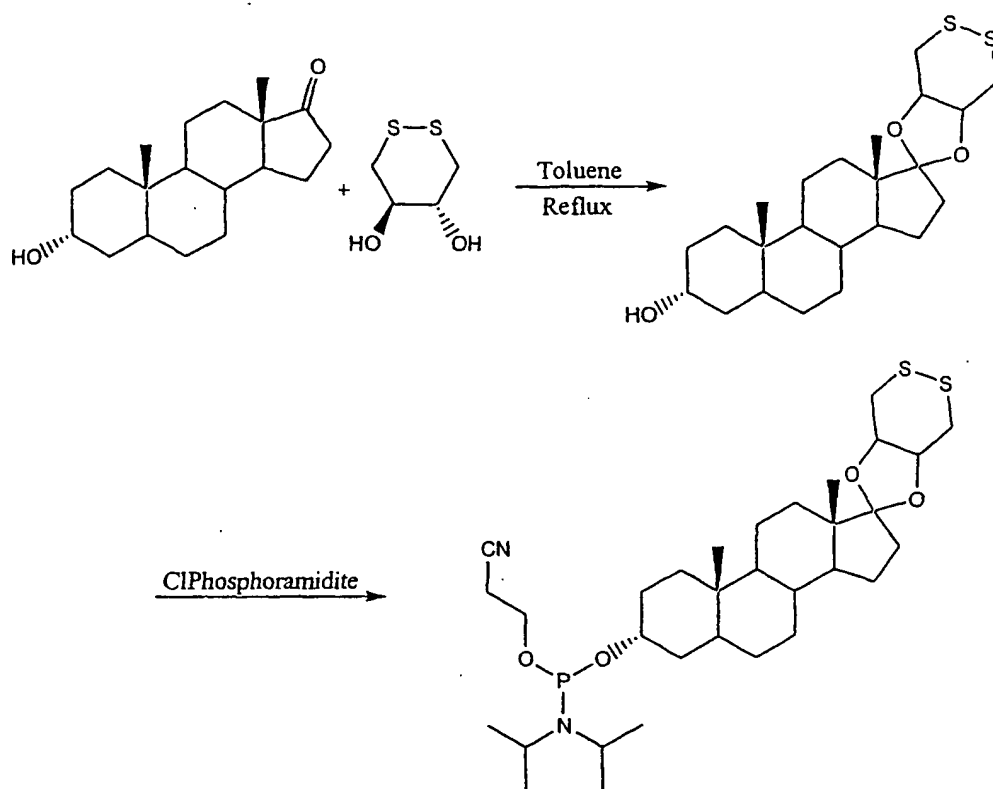
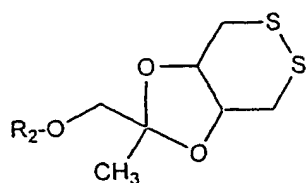


FIG. 44



2.

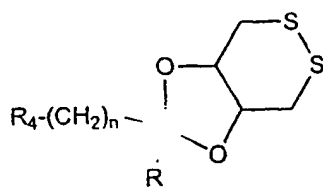
 R_2

a = H

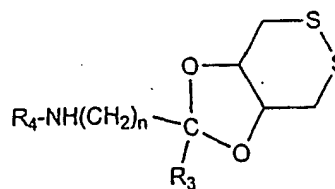
b = (iPr)₂NP(OCH₂CH₂CN)-c1 = 5'-p(A₂₀)-GCAGACCTCA [SEQ ID NO: 68]c2 = 5'-p(A₂₀)-CCTATGTGTCG [SEQ ID NO: 69]D = 5'-p(A₂₀) [SEQ ID NO: 70]

Target I = 63-mer oligonucleotide with target region:

3'-.....CGTCTGGAGTGGATACACAGC.....5'
[SEQ ID NO: 71]



3.



4.

R_3 = hydrogen, an alkyl group, an aryl group, or a substituted alkyl or aryl group

R_4 = an attached oligonucleotide or modified oligonucleotide

FIG. 45

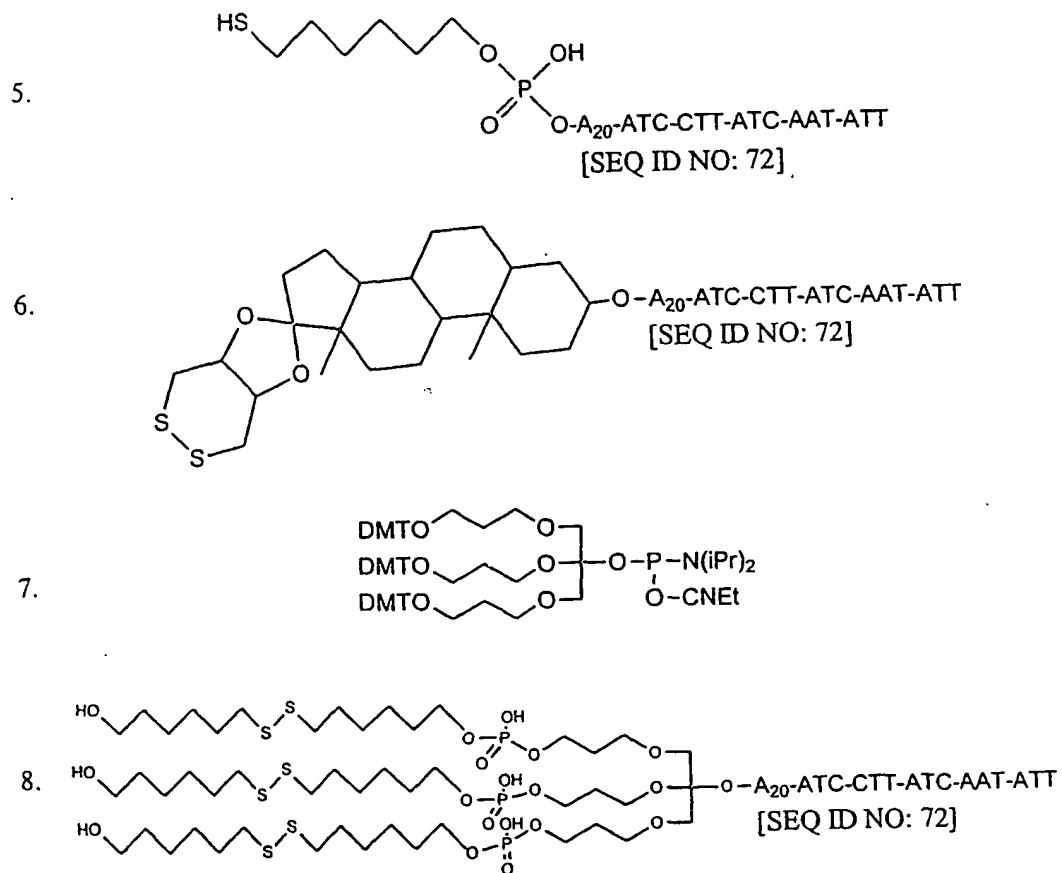
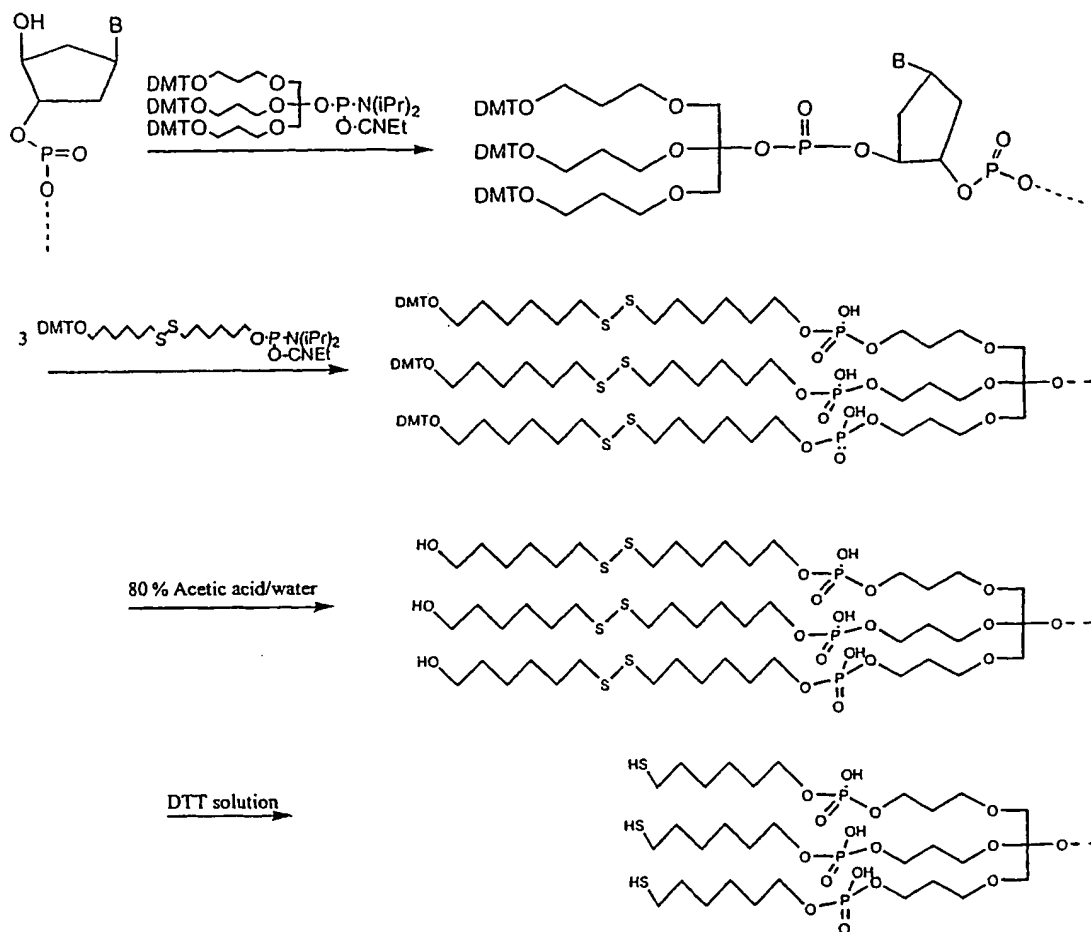


FIG. 46



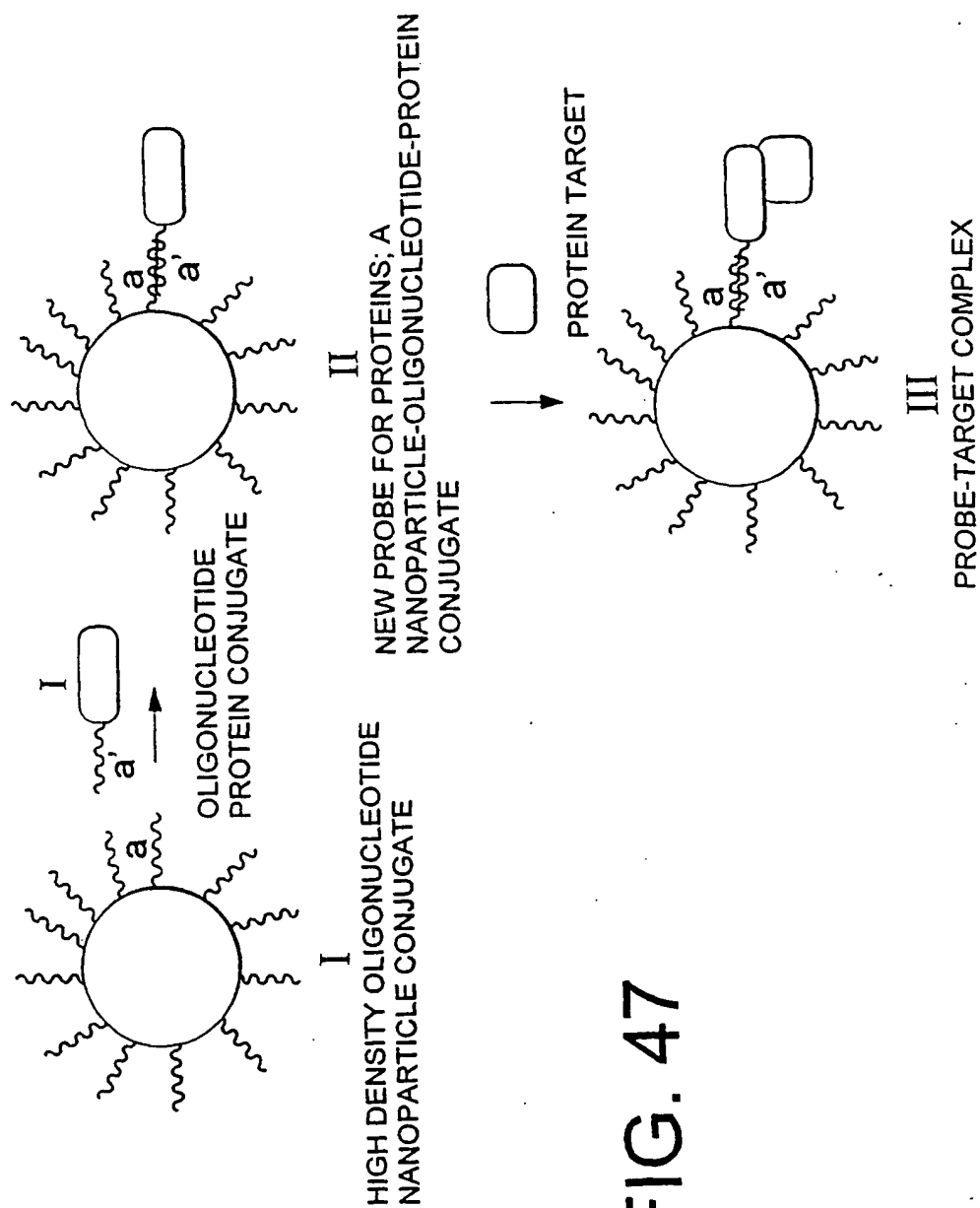
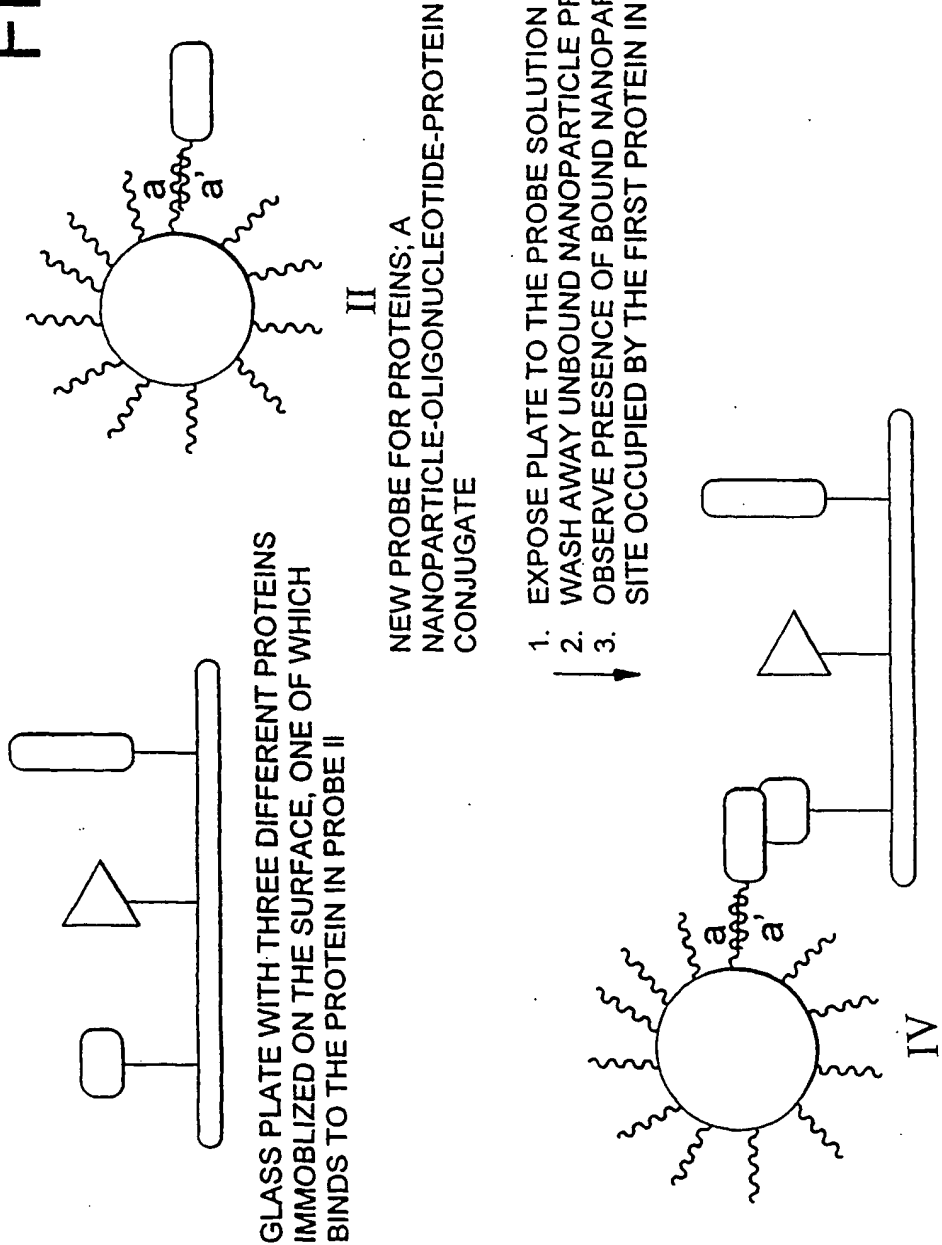


FIG. 47

FIG. 48



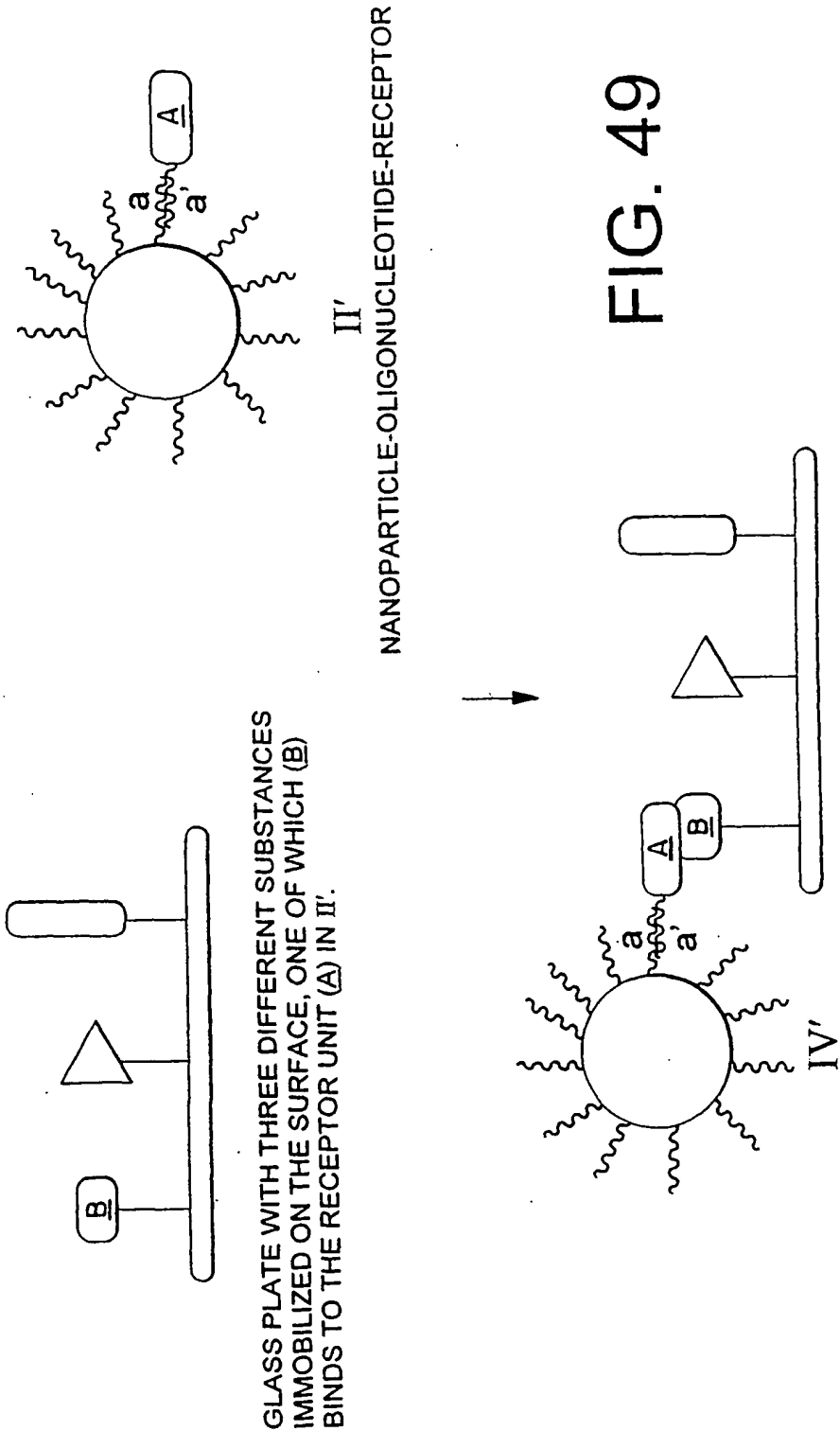


FIG. 50A

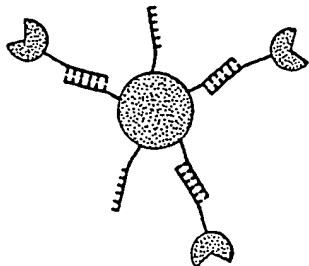


FIG. 50B

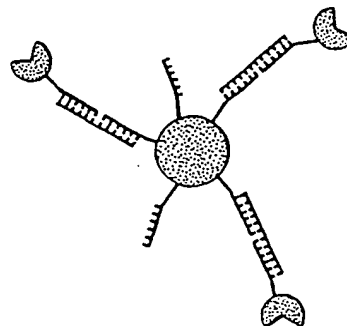


FIG. 51A

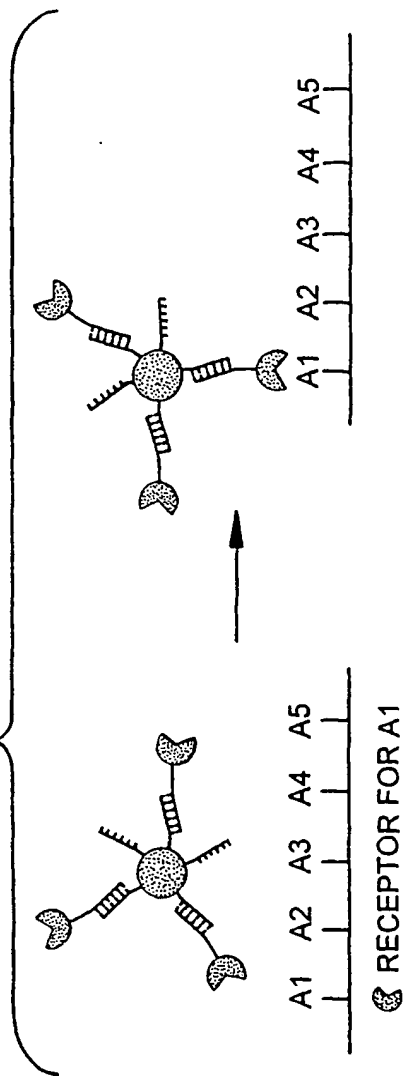
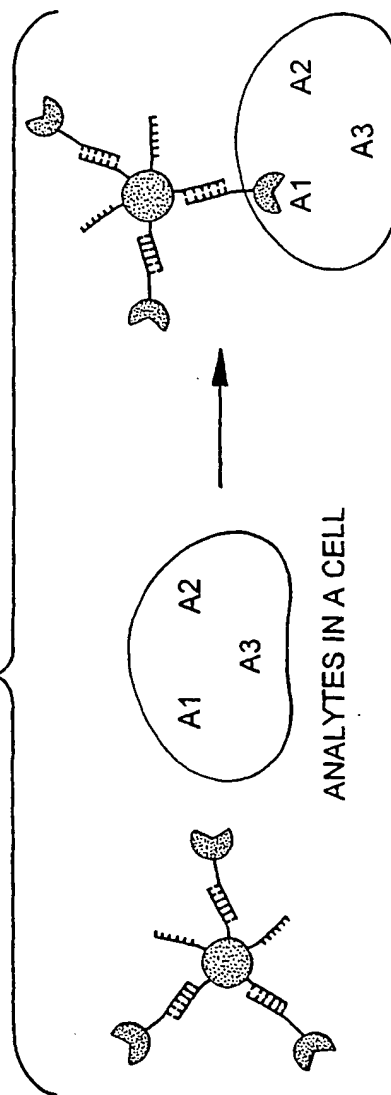
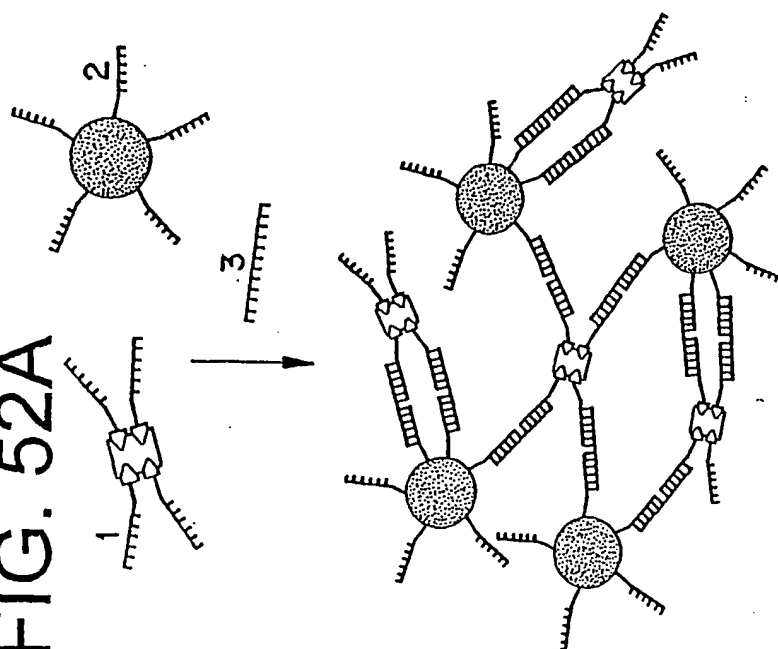


FIG. 51B



ANALYTES IN A CELL

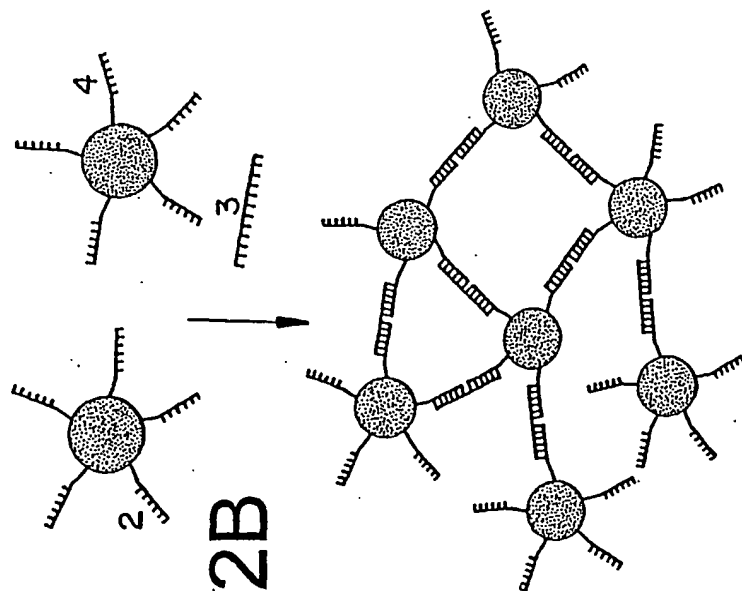
FIG. 52A



- 1 3' biotin-TEG-A₁₀-ATG CTC AAC TCT 5' [SEQ. ID NO. 73]
 2 5' SH(CH₂)₆-A₁₀-CGC ATT CAG GAT 3' [SEQ. ID NO. 74]
 3 5' TAC GAG TTG AGA ATC CTG AAT GCG 3' [SEQ. ID NO. 75]

● 13 nm Au NANOPARTICLES [] STREPTAVIDIN

FIG. 52B



- 2 5' SH(CH₂)₆-A₁₀-CGC ATT CAG GAT 3'
 3 5' TAC GAG TTG AGA ATC CTG AAT GCG 3'
 4 3' SH(CH₂)₃-A₁₀-ATG CTC AAC TCT 5'

● 13 nm Au NANOPARTICLES

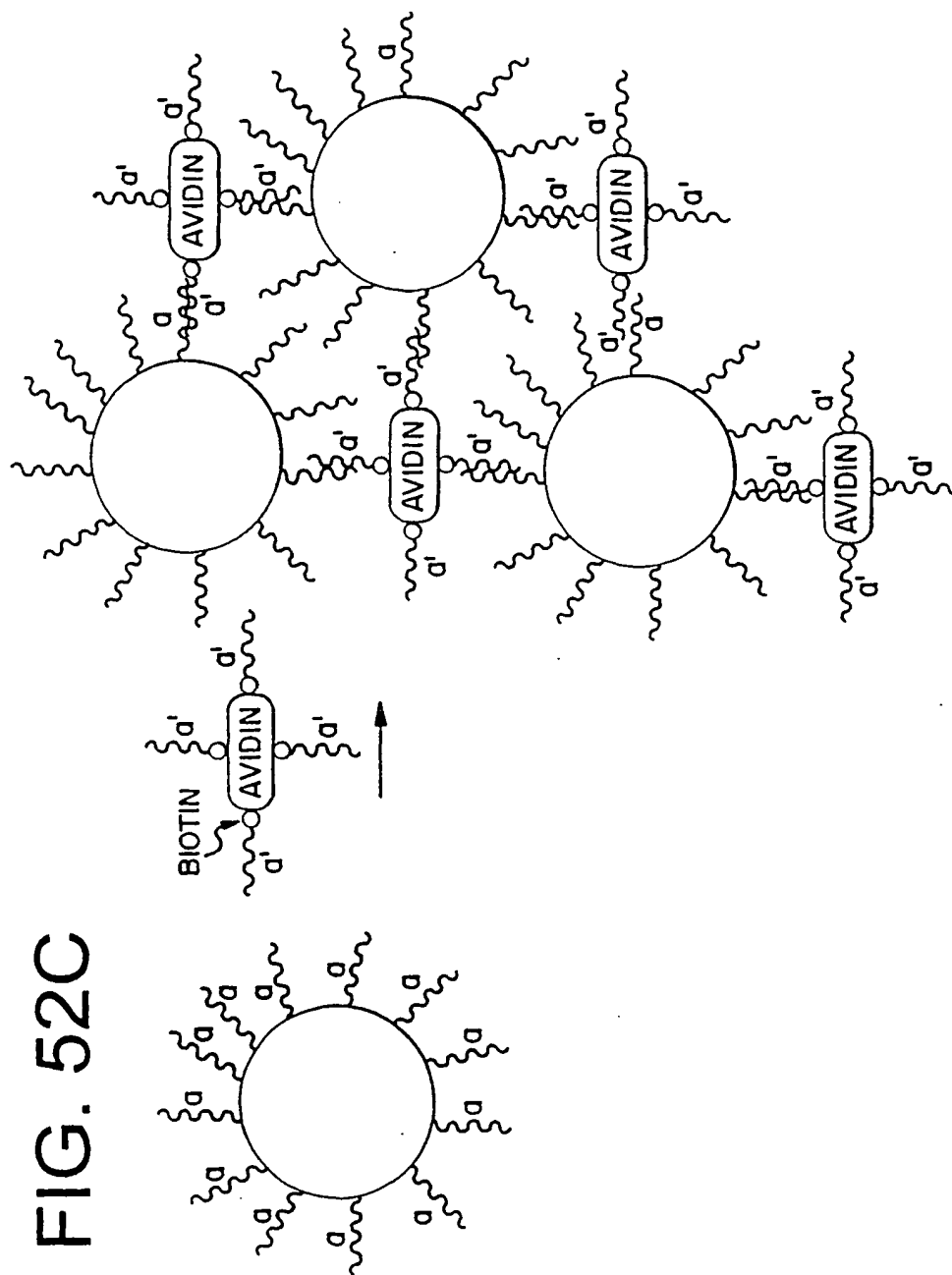


FIG. 52C

FIG. 53

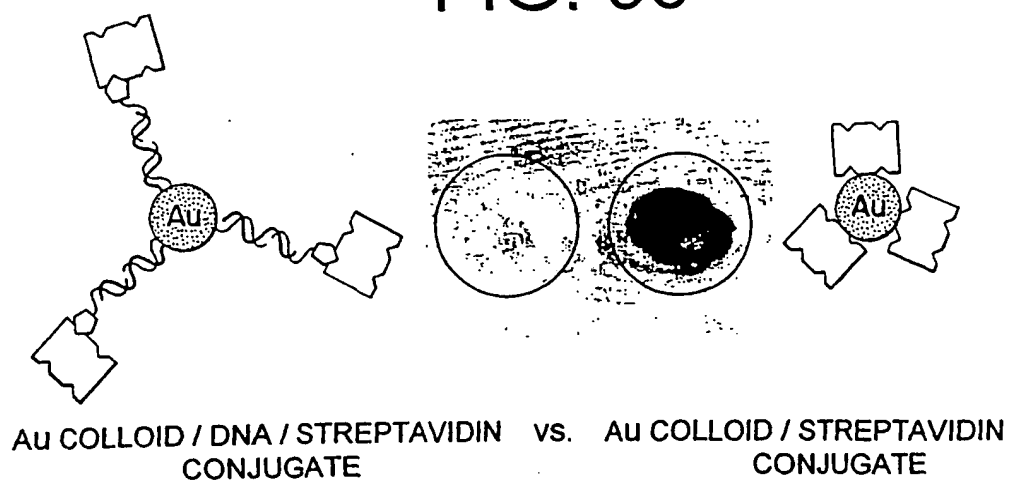


FIG. 54

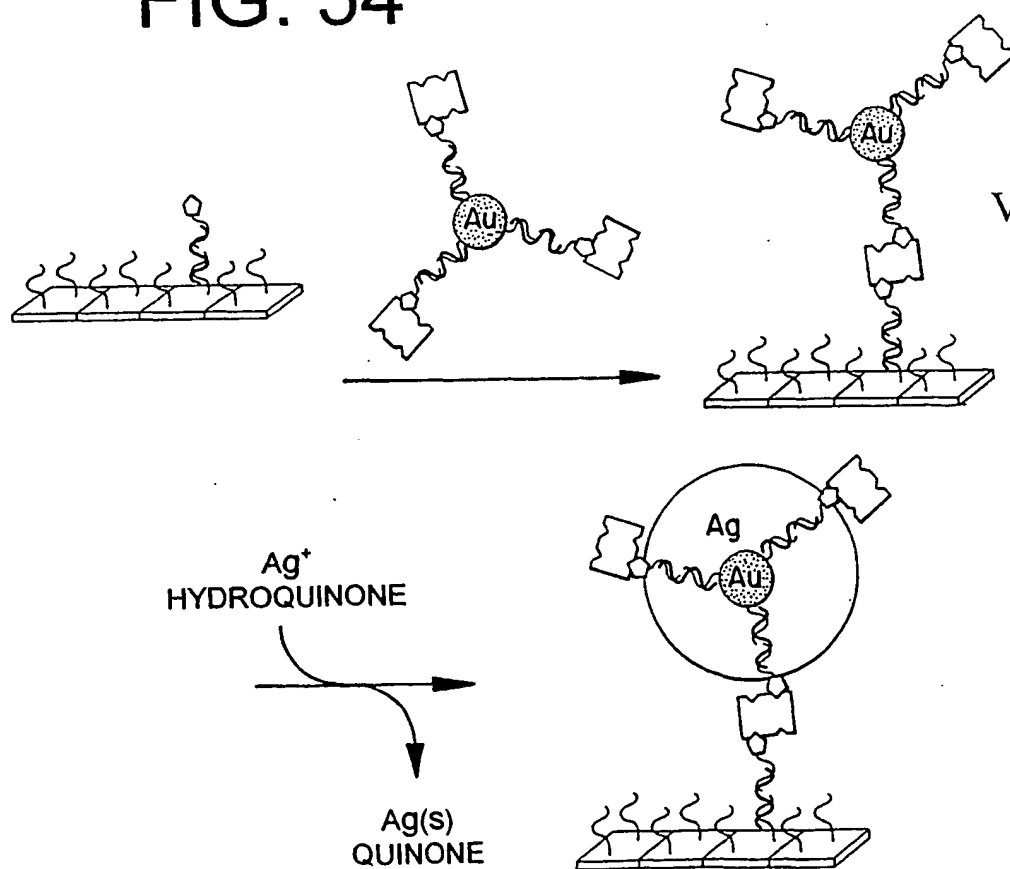


FIG. 55

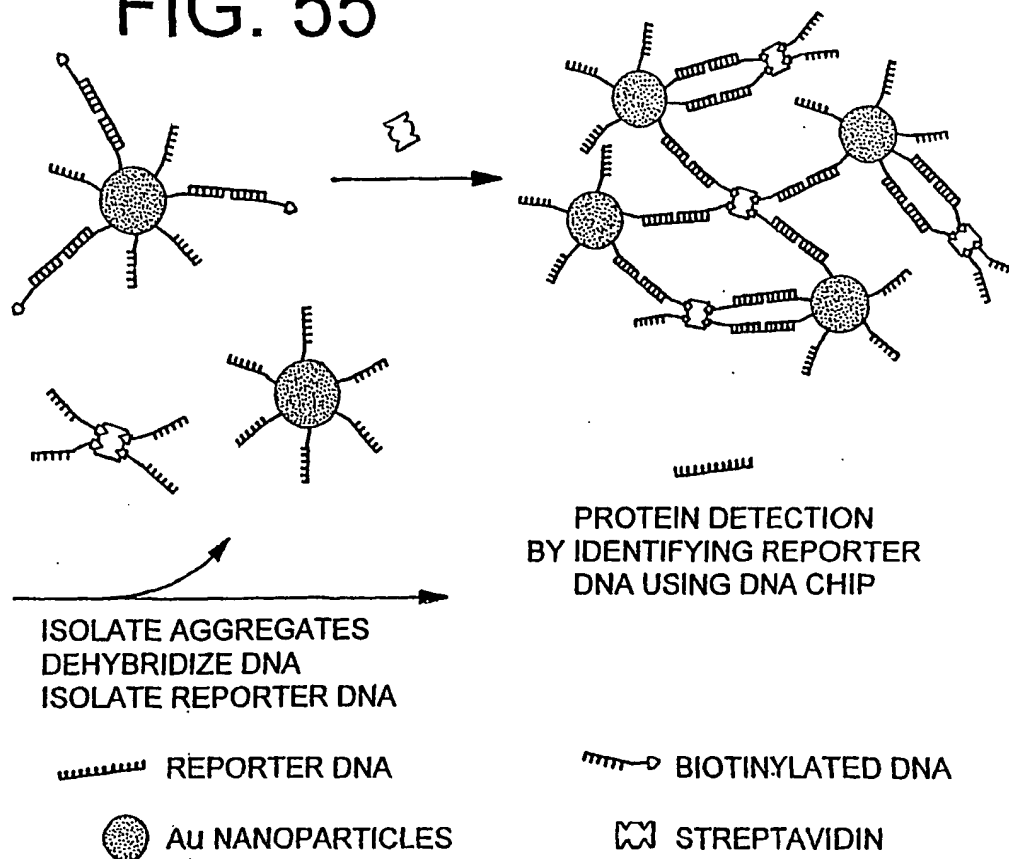


FIG. 56

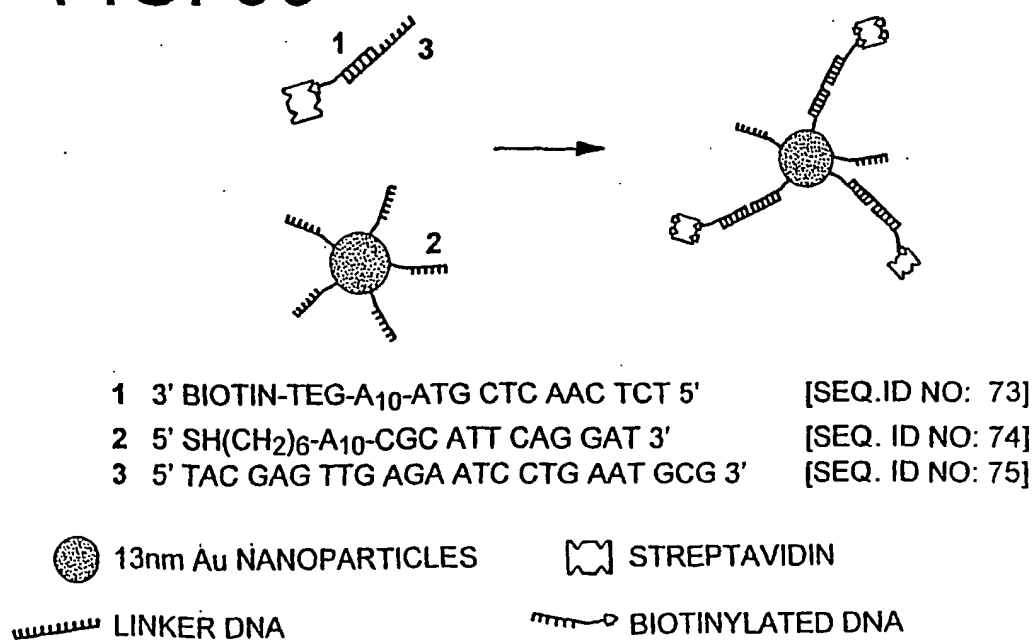


FIG. 57A

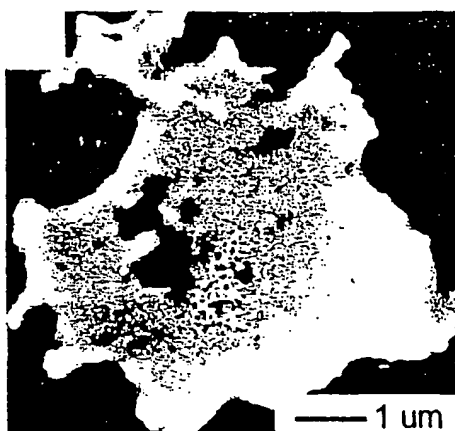


FIG. 57B

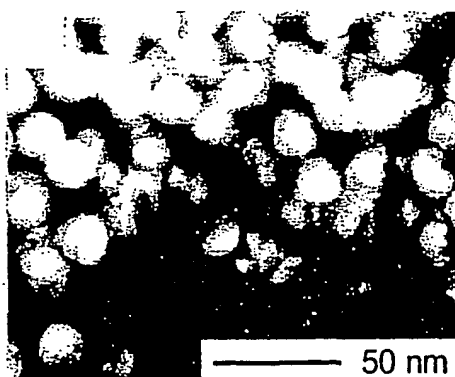


FIG. 58A

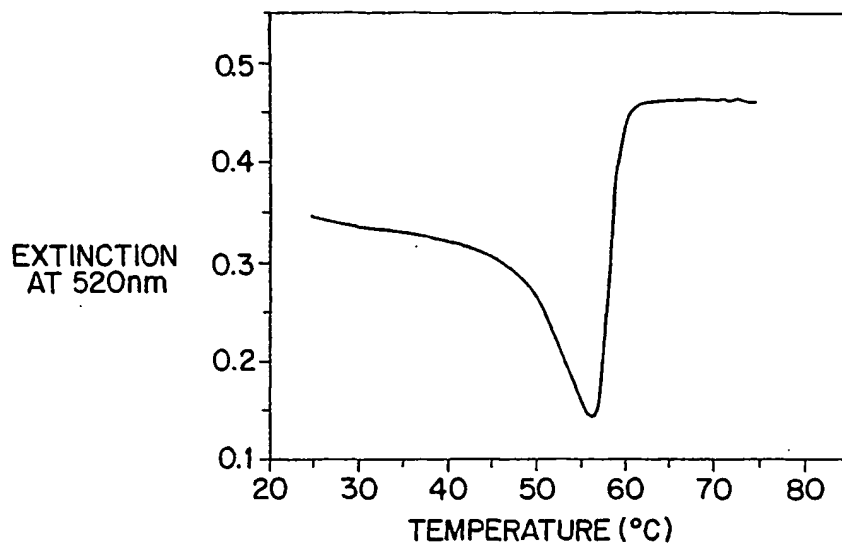


FIG. 58B

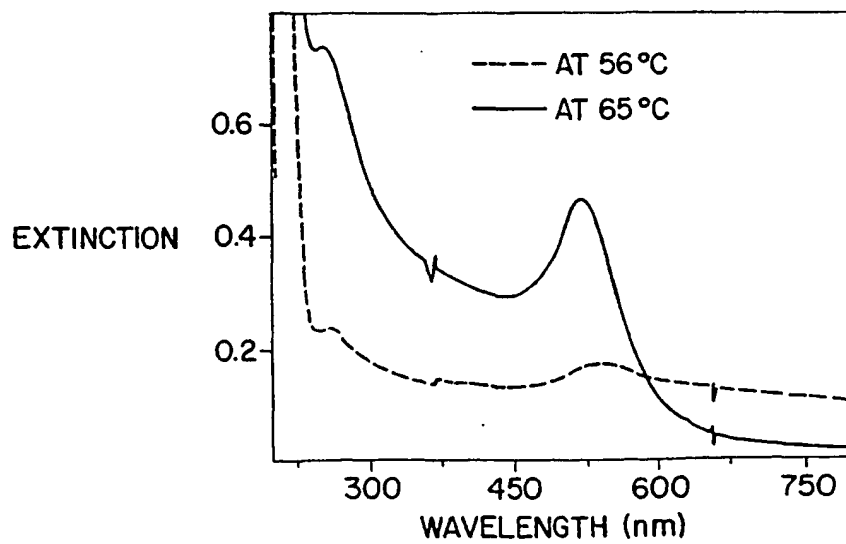


FIG. 59

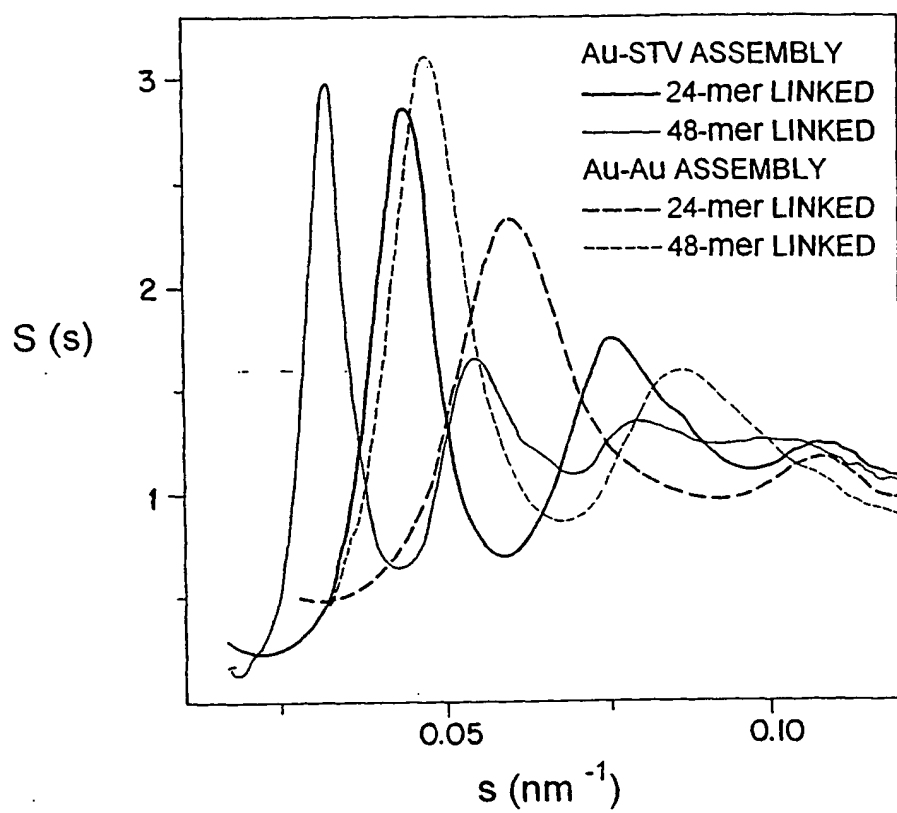
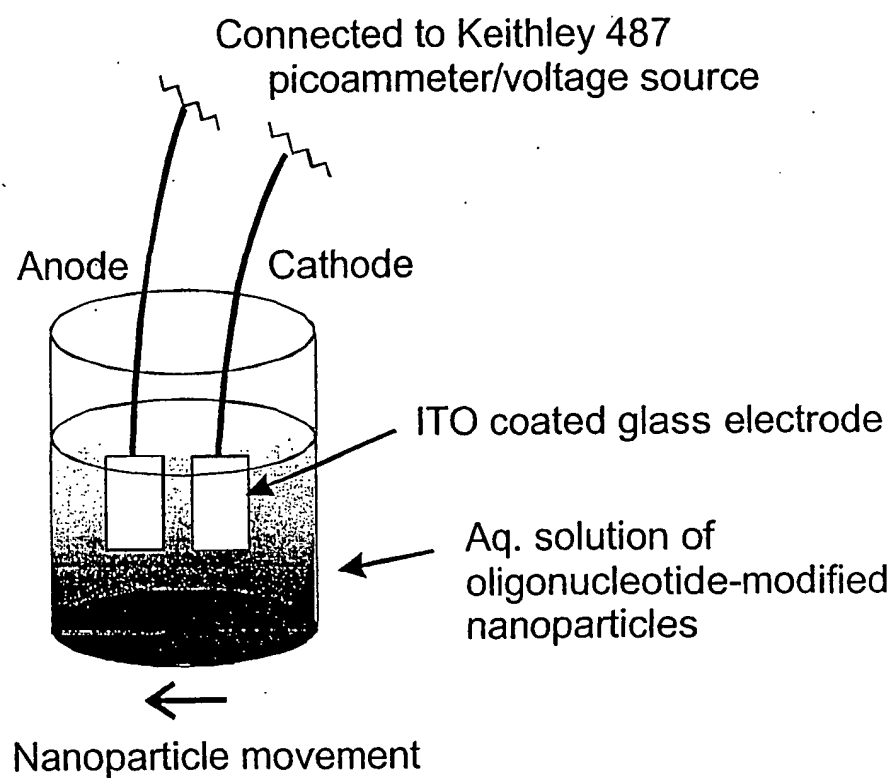


Figure 60

Scheme 1



SEQUENCE LISTING

<110> Mirkin, Chad A.
Latsinger, Robert L.
Mucic, Robert C.
Storhoff, James J.
Elghanian, Robert
Taton, Thomas A.

<120> NANOPARTICLES HAVING OLIGONUCLEOTIDES ATTACHED THERETO
AND USES THEREFOR

<130> 4149-1-1-1-1

<140> Not Yet Assigned

<141> 2000-06-26

<150> 60/031,809

<151> 1996-07-29

<150> PCT/US97/12783

<151> 1997-07-21

<150> 09/240,755

<151> 1999-01-29

<150> 09/344,667

<151> 1999-06-25

<150> 60/200,161

<151> 2000-04-26

<160> 64

<170> PatentIn Ver. 2.1

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<220>

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synthetic sequence

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synthetic sequence

<400> 2
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20

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<213> Artificial Sequence

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ccttgagatt tccctc

16

<210> 4
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synthetic sequence

<400> 4
gagggaaatc tcaagg

16

<210> 5
<211> 18
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synthetic sequence

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<210> 6
<211> 26
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<213> Artificial Sequence

<220>
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synthetic sequence

<400> 6
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<210> 7
<211> 15
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<213> Artificial Sequence

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synthetic sequence

<400> 7
tctccttccc ttttc 15

<210> 8
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synthetic sequence

<400> 8
gaaaaggaggaa ggaga 15

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synthetic sequence

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cttttccctt cctct

15

<210> 10

<211> 28

<212> DNA

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aaacgactct agcgcgtata gttgccat

28

<210> 11

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28

<210> 12

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cctatcgacc atgct

15

<210> 13

<211> 30

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 13

agcatgggtcg ataggaaacg actctagcgc

30

<210> 14

<211> 15

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: random
synthetic sequence

<400> 14

gcgctagagt cgttt

15

<210> 15

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: random
synthetic sequence

<400> 15

agcatgggtcg ataggatggc aactatacgc

30

<210> 16

<211> 24

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 16

gtcgatagga aacgactcta gcgc

24

<210> 17

<211> 30

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 17

agcatggttg ataggaaacg actctagcgc

30

<210> 18

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:random
synthetic sequence

<400> 18

agcatgtttg ataggaaacg actctagcgc

30

<210> 19

<211> 12

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:random
synthetic sequence

<400> 19

tctcaactcg ta

12

<210> 20

<211> 12

<212> DNA

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synthetic sequence

<400> 20
cgcattcagg at

12

<210> 21
<211> 24
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synthetic sequence

<400> 21
tacgagttga gagagtgcc acat

24

<210> 22
<211> 24
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<213> Artificial Sequence

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synthetic sequence

<400> 22
tacgagttga gaatcctgaa tgcg

24

<210> 23
<211> 24
<212> DNA
<213> Artificial Sequence

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synthetic sequence

<400> 23
tacgagttga gaatcctgaa tgct

24

<210> 24

<211> 24

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:random
synthetic sequence

<400> 24

tacgagttga gactcctgaa tgcg

24

<210> 25

<211> 23

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 25

tacgagttga gaatcctgaa tgc

23

<210> 26

<211> 25

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 26

tacgagttga gacatcctga atgcg

25

<210> 27

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:random
synthetic sequence

<400> 27

tacgagttga gaatcctgaa tgcg

24

<210> 28

<211> 12

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:random
synthetic sequence

<400> 28

taggacttac gc

12

<210> 29

<211> 48

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 29

tacgagttga gaccgttaag acgaggcaat catgcaatcc tgaatgcg

48

<210> 30

<211> 24

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 30

tgcacgattg cctcgctctta acgg

24

<210> 31

<211> 72

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 31

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atcctgaatg cg 72

<210> 32

<211> 48

<212> DNA

<213> Artificial Sequence

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synthetic sequence

<400> 32

gttggtcgtgta aagcgtccaa tatatgcatg attgctcgt cttaacgg 48

<210> 33

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<400> 33

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tacgagttga gaatcctgaa tgcg 24

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synthetic sequence

<400> 35
cgcattcagg at

12

<210> 36
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<213> anthrax

<400> 36
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attattgtta aatattgata aggatataag aaaaatatta tccagggtta tattgtagaa 120
attgaagata ctgaagggt t 141

<210> 37
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synthetic sequence

<400> 37
taacaataat ccctc

15

<210> 38
<211> 15
<212> DNA
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<220>
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synthetic sequence

<400> 38
atccttatca atatt

15

<210> 39
<211> 30
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<213> Artificial Sequence

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synthetic sequence

<400> 39
tgagcctcct taactactga ctcacccgcc

<210> 40
<211> 25
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<220>
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synthetic sequence

<400> 40
tggtgacgaa ttaattactt ctcta

<210> 41
<211> 27
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<213> Artificial Sequence

<220>
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synthetic sequence

<400> 41
tataaccctg gataatattt ttcttat

<210> 42
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<213> Artificial Sequence

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synthetic sequence

30

25

27

<400> 42

aagcccttca gstatcttcaa tttctacaa

29

<210> 43

<211> 22

<212> DNA

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synthetic sequence

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tctcaactcg taaaaaaaa aa

22

<210> 44

<211> 24

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synthetic sequence

<400> 44

tacgagttga gaatcctgaa tgcg

24

<210> 45

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: random
synthetic sequence

<400> 45

aaaaaaaaaa cgcattcagg at

22

<210> 46

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<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:random
synthetic sequence

<400> 46

tctcaactcg taaaaaaaaa aa

22

<210> 47

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:random
synthetic sequence

<400> 47

aaaaaaaaaa cgcattcagg at

22

<210> 48

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:random
synthetic sequence

<400> 48

tacgagttga gaatcctgaa tgcg

24

<210> 49

<211> 24

<212> DNA

<213> Artificial Sequence

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synthetic sequence

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ctacttagat ccgagtgccc acat

24

<210> 50
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synthetic sequence

<400> 50
cgcatcagg at

12

<210> 51
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<220>
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synthetic sequence

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aaaaaaaaaa aaaaaaaaaa cgcatcagg at

32

<210> 52
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
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synthetic sequence

<400> 52
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32

<210> 53
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:random
synthetic sequence

<400> 53.
atcctgaatg cg 12

<210> 54
<211> 12
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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:random
synthetic sequence

<400> 54
atcctgaatg cg 12

<210> 55
<211> 20
<212> DNA
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<220>
<223> Description of Artificial Sequence:random
synthetic sequence

<400> 55
aaaaaaaaaa aaaaaaaaaa 20

<210> 56
<211> 27
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<213> Anthrax

<400> 56
ggattattgt taattattga taaggat 27

<210> 57
<211> 12
<212> DNA
<213> Anthrax

<400> 57
taacaatnat cc 12

<210> 58
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<400> 58
atccttatca atatt

15

<210> 59
<211> 12
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<220>
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synthetic sequence

<400> 59
tctcaactcg ta

12

<210> 60
<211> 24
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<223> Description of Artificial Sequence:random
synthetic sequence

<400> 60
tacgagttga gaatcctgaa tgcg

24

<210> 61
<211> 48
<212> DNA
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<220>
<223> Description of Artificial Sequence:random
synthetic sequence

<400> 61
gcgtaagtcc taacgtacta acggagcaga attgccagag ttgagcat

48

<210> 62
<211> 72
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: random
synthetic sequence

<400> 62
gcgtaagtcc tacaacaggc atttcgcagg ttatatacgt actaacggag cagaattgcc 60
agagttgagc at 72

<210> 63
<211> 24
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: random
synthetic sequence

<400> 63
tgcattgattg cctcgtctta acgg 24

<210> 64
<211> 48
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: random
synthetic sequence

<400> 64
gttggtccgta aagcgtccaa tatatgcatg attgcctcgt cttaacgg 48

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